SPATIOTEMPORAL PATTERNS OF AVOIDANCE IN KINGS CROSS

AN EXPLORATION OF THE ENVIRONMENTAL CUES THAT TRIGGER FEAR OF CRIME

By

MELISSA BURGESS

A thesis submitted for the degree of

Doctor of Philosophy

of the

Australian National University

January 2008

Statement of Originality

Except where otherwise acknowledged, this thesis is my own original work.

I declare that this thesis has not been submitted for a higher degree to any other university or tertiary institution.

Melissa Burgess

January 2008

Abstract

Regardless of whether crime is present, people avoid areas where they feel afraid of becoming a victim of crime. This behavioural response has caused fear of crime to emerge as a distinct phenomenon that can create numerous problems for both the individual and community. Research into fear of crime has the potential to provide valuable information that could be used to reduce the public's fear of crime and curb the negative consequences that result from this phenomenon.

While fear of crime has been a topic of interest for a long period of time, only relatively recently have researchers begun to implement fear mapping as a tool for providing new information not available through traditional statistical means. This research uses avoidance mapping to provide a spatiotemporal investigation into people's fear of being robbed, beaten or attacked. It also explores the environmental cues that trigger people's fear and their consequent avoidance reaction. By doing this, the research tests the hypothesis that the spatial visualisation of avoidance can provide new information concerning public fear of crime.

This research was conducted in Kings Cross, New South Wales, an area historically associated with crime and fear of crime. A Geographic Information System was used to map areas that the respondents avoided because they were afraid of crime. Sixteen series of two-dimensional (2D) avoidance maps were produced, with each series of maps showing the patterns of avoidance triggered by a different environmental cue. Eight of these environmental cues related to the social environment. They included the presence of drug users, spruikers, homeless people, intoxicated persons, sex workers, gangs, loitering people and the absence of pedestrians. The remaining eight environmental cues related to the physical environment. They included the occurrence of poor street lighting and vandalism, the presence of rubbish or syringes, rundown or abandoned buildings, offensive or degraded shops, areas to hide, blocked escape and laneways.

The 2D maps confirmed that all of the environmental cues triggered fear of crime and that avoidance levels were consistently higher during the night than the day. They

also illustrated that each of the environmental cues triggered different levels of avoidance. The perceived presence of drug users, intoxicated persons and gangs triggered the highest levels of avoidance. The perceived presence of sex workers triggered the lowest levels of avoidance. The avoidance maps further revealed that the environmental cues triggered distinct patterns of avoidance, showing obvious fear hotspots, as well as streets perceived to be safe thoroughfares through those fear hotspots. Likewise, many of the avoidance maps displayed streets that act as cognitive barriers separating seemingly safe and unsafe areas. This information provides some new spatially sensitive insights into how people react to fear of crime through avoidance. It additionally provides an evidence base that can be used by police and governments when allocating resources to specific environmental cues in those critical fear hotspots.

The 2D avoidance maps for four environmental cues were selected for further exploration using three-dimensional (3D) mapping. These were drug users, sex workers, areas to hide and gangs. The 3D avoidance maps exposed micro-scale differences in patterns of avoidance between these environmental cues. An exploration of the avoidance reaction adopted by different socio-demographic groups in response to drug users and sex workers was additionally carried out. Separate maps were produced for men and women, and residents of, and visitors to, Kings Cross. These 3D avoidance maps were examined in light of council development plans and the presence of actual disorder in the area. Recommendations for policy, planning and practice were then given based on this examination of the research findings.

Acknowledgements

I would like to acknowledge the following people for their contributions to this study:

Professor Brian Lees, University of New South Wales at the Australian Defence Force Academy, for supervising my PhD research. Brian was exceptional in mentoring and offering both academic and general advice, while providing me with a great deal of independence. Brian's consistent support, candour and availability is appreciated. Associate Professor Julie Stubbs, University of Sydney, is also recognised for co-supervising my PhD research. Julie provided thorough and constructive feedback on my chapter drafts. Julie gave particularly useful advice on the interviewing procedure and also liaised with her 2004 Masters of Criminology Students to conduct the interviewing. Dr Bruce Doran, Australian National University, for early assistance with the survey design and for reading and commenting on my final thesis draft. Professor Peter Kanowski, Australian National University, for supporting my application for an ANU PhD Scholarship. Peter also granted me permission to become an externally based PhD student, of which I am very grateful. Likewise, Peter approved SRES financial assistance enabling me to attend various Australian and international conferences during my PhD research.

Superintendent David Darcy, NSW Police Force, for providing the opportunity to undertake this study in the Kings Cross Local Area Command. Dave provided much insight regarding the implementation of the project. Dave's early endorsement and continuing interest in fear of crime research is also valued. Inspector Gary Groves, NSW Police Force, was also instrumental during the interviewing stage of the project. Gary provided me with materials necessary for interviewing, helped with interviewer training, a temporary office and distributing information fliers. All NSW Police officers stationed in Kings Cross and Woolloomooloo during 2004 are acknowledged, for accommodating me during this period. Chris Devery, NSW Police Force, is thanked for liaising between the NSW Police Legal Services and myself regarding the exchange of crime data.

The 2004 University of Sydney Masters of Criminology Students, and Volunteers in Policing (VIP) are appreciated for their time, professionalism and assistance conducting interviews. In particular, I would like to thank the VIPs Warwick and Jim for their outstanding participation. Their assistance was central to the acquisition of the large dataset used in the research. Helen Steptoe, VIP, also provided me with immense support during the data entry phase of the project.

Emeritus Professor Diana Howlett, for funding the Howlett Honours Prize for Geography. I was awarded this prize in 2004 and used the financial gift to purchase numerous fear of crime books that I could not find in Australian libraries. Douglas Grand, General Manager of the Kings Cross Licensing Accord, for his donation in 2004 to help with costs associated with the interviewing stage of the project. Associate Professor Mary Crock, The University of Sydney, for awarding me the Best Presentation at the 2005 Postgraduate Law Conference, which payment assisted me in becoming a member of various academic organisations.

Dr Don Weatherburn, Director of the NSW Bureau of Crime Statistics and Research, for granting me study leave from work during the final stages of my thesis writing. Jackie Fitzgerald, Deputy Director of the NSW Bureau of Crime Statistics and Research, for allowing me to use this study leave at times that I requested.

Barbara Burgess, my mum, for her encouragement throughout my studies. Mum also provided invaluable editing of my chapter drafts. Ron Kershaw, my 'dad in-law', for constantly accommodating and feeding me on university related trips to Canberra. SRES staff and students are thanked for creating the sense of community that extended to students based off-campus. My other friends and family are also acknowledged, for listening to the highs and lows of my PhD research.

Melinda Kershaw, my partner, is appreciated above all for putting up with me during my research. Melinda's patience, stability, reassurance, motivation and general support was invaluable.

Table of Contents

List of Tables

List of Figures

List of Plates

Glossary of Terms and Phrases

Attribute / attribute data	Information describing the characteristics of map features in a Geographic Information System (McDonnell & Kemp, 1995). For example, attributes of an area avoided by a respondent include the respondent's gender, age and income and the environmental cues that triggered the respondent to feel afraid of crime in that area.
Attribute assigning	The process of assigning attributes to map features.
Avoidance behaviour	Defined by Du bow *et al*. (1979) as "actions to decrease exposure to crime by removing oneself from, or increasing the distance from, situations in which the risk of criminal victimization is believed to be high" (Garofalo, 1981).
Avoidance hardness	How hard a respondent tried to avoid an area because they were afraid of crime.
Avoidance hardness weights	The numeric values that represent how hard, on average, the respondents tried to avoid each area because they were afraid of crime.
Class	Map features or raster pixels that are grouped into a category based on their attribute values representing a commonly defined condition. For example, two and ten respondents may respectively avoid two areas. The two areas may be grouped and displayed on the map in same way, both falling into the class of '0-5%' of respondents avoiding an area of the study site.
Classification	The process of arranging map features or raster pixels into groups or categories based on their attribute values and the process of representing those map features or raster pixels by the same symbol (McDonnell & Kemp, 1995).
Cognitive map	A mental copy of ones environment, featuring information about the relative spatial location, arrangements and properties of phenomena (Levine, 1982 in Sholl, 1996; Downs, 1981; Block, 1998; Downs & Stea, 1973). Such phenomena include landmarks like buildings, parks or street junctions.
Coordinate system	A fixed reference framework superimposed onto the surface of the earth to designate the position of points located on it, and a set of rules used to define the positions of points in space (McDonnell & Kemp, 1995).
Coordinates	Values represented by x, y, and possibly z, that define a position in terms of a spatial reference framework. Coordinates are used to represent features and locations on the earth's surface relative to other features and locations (McDonnell & Kemp, 1995).

Disorder	Physical or social factors that trigger fear of crime because they depict an area lacking social control.
Environmental cues	Physical or social factors which trigger fear of crime (includes disorders, incivilities and threatening environments).
Fiducial points	A visually identifiable point in space that can be used to georeference a non-georeferenced image. The same point in space is identified on another image with a coordinate system. The coordinates for the point are obtained from this image and then assigned to the same point on the non-georeferenced image.
Geographic Information System/s (GIS)	An arrangement of computer hardware and software that people interact with to integrate, analyse, and visualise spatial data; identify relationships, patterns, and trends; and find solutions to problems. The system is designed to capture, store, update, manipulate, analyse and display geographic information. A GIS is typically used to represent maps that can be studied and used to perform spatial analyses (McDonnell & Kemp, 1995).
Georeferencing (also known as geometric transformation, polynomial transformation or rectification)	Assigning coordinates from a known reference system to the page coordinates of a raster (image) or a planar map (McDonnell & Kemp, 1995). For example, assigning a latitude and longitude to the survey maps so that the avoided areas could be mapped in the GIS.
Geostatistics	A class of statistics used to analyse and predict the values associated with spatial or spatiotemporal phenomena (McDonnell & Kemp, 1995). See also *spatial statistics*.
Grid	A network of parallel and perpendicular lines superimposed on a map and used for reference (McDonnell & Kemp, 1995). A more general term for a raster, see below.
Incivilities	Another term for *disorder*. See above.
Mismatch	The spatial dissonance between sites of crime and areas of fear of crime.
Natural surveillance	The presence of other people on the street who can watch for criminals.
Polynomial transformation	See *Georeferencing*.
Population percentile bands	Contour lines on the 3D fear maps that show what percentage of the respondents avoided each area.
Projection / Projecting process	A method by which the curved surface of the earth is portrayed on a flat surface. This generally requires a systematic mathematical transformation of the earth's graticule of lines of longitude and latitude onto a plane (McDonnell & Kemp, 1995).

Raster	A spatial data model that defines space as an array of equally sized cells arranged in rows and columns. Each cell contains an attribute value and coordinates. Groups of cells sharing the same value represent geographic features or feature classes (McDonnell & Kemp, 1995).
Rasterisation	The conversion of vector data (spatial data held as a series of points, lines, and polygons) to raster data (an array of cell values) (McDonnell & Kemp, 1995).
Raster cleanup	The process of drawing, filling, and erasing raster cells using ArcScan Raster Cleanup and Raster Painting tools (McDonnell & Kemp, 1995).
Rectification	See *Georeferencing*.
Scanning	The process of capturing data from hard copy maps or images in raster format using a device called a scanner. The scanner records the information in raster format (McDonnell & Kemp, 1995).
Shapefile	A vector data storage format for storing the location, shape and attributes of geographic features (McDonnell & Kemp, 1995).
Spatial analysis	The process of examining the locations, attributes, and relationships of features in spatial data through overlay and other analytical techniques in order to address a question or gain useful knowledge. Spatial analysis extracts or creates new information from spatial data (McDonnell & Kemp, 1995).
Spatial behaviour	Any form of human behaviour that involves or exhibits an interaction between the individual and one or more points in space (Louvierre, 1976). It is the result of a complex decision process that is dependent on one's cognitive map of the spatial environment (Burnett, 1976; Downs & Stea, 1973; Freundschuh, 1998).
Spatial cognition	Defined by Hart and Moore as "the internalised reflection and reconstruction of space in thought" (Golledge *et al*., 1976).
Spatial modelling	The methodology or set of analytical procedures used to derive information about spatial relationships between geographic phenomena (McDonnell & Kemp, 1995).
Spatial statistics	Statistical methods that use space and spatial relationships (such as distance, area, volume, length, height, orientation, centrality and/or other spatial characteristics of data) directly in their mathematical computations (McDonnell & Kemp, 1995).
Spiral of decline	The proposed cycle, commencing when individuals fear crime and avoid feared areas, which may ultimately lead to the physical, social and economic decay of affected communities (Taylor & Hale, 1986).

Stretched (symbology)	A map display technique that increases the visual contrast between cells of similar value when applied to raster datasets (McDonnell & Kemp, 1995). See also *geostatisitcs*.
Symbology	The set of conventions, rules, or encoding systems that define how geographic features (or classes) are represented with symbols (or colours) on a map (McDonnell & Kemp, 1995).
Threatening environments	Areas that generate fear of crime for reasons other than the presence of disorder or incivilities.
Vector	A coordinate-based data model that represents geographic features as points, lines, and polygons. Attributes are associated with each feature, as opposed to a raster data model, which associates attributes with grid cells (McDonnell & Kemp, 1995).
Vectorisation	The conversion of raster data (an array of cell values) to vector data (spatial data held as a series of points, lines, and polygons) (McDonnell & Kemp, 1995).
z-factor	A conversion factor used to adjust vertical and horizontal measurements into the same unit of measure. Specifically, the number of vertical units (z-units) in each horizontal unit (McDonnell & Kemp, 1995).
z-value	The value for a given surface location that represents an attribute other than position. For example in an elevation model, the z-value represents elevation (McDonnell & Kemp, 1995).

List of Acronyms

ABS	Australian Bureau of Statistics
AML(s)	Arc Macro Language (Scripts)
BOCSAR	NSW Bureau of Crime Statistics and Research
CPTED	Crime Prevention Through Environmental Design
ESNA	East Sydney Neighbourhood Association Inc
GDA	Geocentric Datum of Australia
GCS	Geographic Coordinate System
GIS	Geographic Information System(s)
LAC	Local Area Command
LGA	Local Government Area
MSIC	Medically Supervised Injecting Centre
NSW	New South Wales
PCYCs	Police Citizens Youth Clubs
TIFF	Tag Image File Format
UK	United Kingdom
USA	United States of America

1. Introduction

This thesis is an exploratory study into the environmental cues that trigger people to feel afraid of being robbed, beaten or attacked. It investigates the hypothesis that spatial visualisation of avoidance can provide useful information not available using other techniques. It is hoped that the results from applying the avoidance mapping techniques developed in this study will increase both researchers' and practitioners' understanding of public fear of crime and have positive implications for policy, planning and practice.

1.1. Project motivation

Fear of crime is regarded as a distinct phenomenon separate from, yet related to, crime (Pain, 1991). While fear of crime is not always negative, provoking people to protect themselves when they are threatened, it becomes problematic when out of proportion with the objective risks of victimisation (Clark, 2003; Warr, 2000). Fear of crime is often found to exceed the real risk of crime, even when considering unreported incidents (Liska *et al*., 1988; Painter, 1996; Taylor & Hale, 1986). The mismatch between the fear of and the incidence of crime is evident from numerous broad level fear of crime studies. These have generally been macro-level analyses set in cities in the United Kingdom, Switzerland, New Zealand and Australia (Borooah, 1997; Box, 1988; Doeksen, 1997; Killias, 2000). However, more recently fear of crime is being examined in developing world contexts and it is likely that the mismatch occurs throughout the world (Chadee & Ditton, 2003). With consequences that negatively affect individuals and the community at large, fear of crime has become a social problem in some areas (Perkins & Taylor, 1996).

Individuals may suffer a range of negative physiological and psychological reactions when they experience fear of crime (Perkins & Taylor, 1996). These reactions can have a debilitating impact on peoples' quality of life, particularly when fear of crime prompts changes in behaviour (Amerio & Roccato, 2005; Ferraro & LaGrange, 2000; Ross & Mirowsky, 1999). A common behavioural change involves people avoiding environments where they feel afraid of crime (Cornell, 13/7/2002; Doeksen,

1997; Doran & Lees, 2003; Nasar, 1993; Painter, 1996). The disorder and decline hypothesis proposes that people physically and psychologically withdraw from such areas, which reduces informal social cohesion, control and surveillance (Skogan & Maxfield, 1981; Skogan, 1986; Skogan, 1990). This supposedly increases the attractiveness of affected areas for criminal opportunities. The broken windows hypothesis also contends that both opportunistic and professional offenders can then infiltrate the area and behave in a disorderly or criminal manner without being impeded (Wilson & Kelling, 1982). The presence of unimpeded disorder and crime encourages more disorder, crime and fear of crime (Wilson & Kelling, 1982). Thereby a positive feedback loop occurs that can ultimately lead to the physical, social, political and economic decay of feared neighbourhoods.

With the potential for public fear of crime to lead to such problems, even to a small degree, fear of crime has become a concern for a number of parties. First, individuals and communities themselves are concerned, as their lifestyles and neighbourhoods are impacted. Business managers and owners, who are affected by lost clientele and poor economic returns, may be interested in what they can do to curb fear of crime. The government, especially in the form of local councils, and agencies such as the police, are interested in maintaining their reputation and promoting a more positive opinion of fear affected neighbourhoods. Reducing fear of crime has become paramount to a variety of policing models employed by police in Australia and overseas (CPOP, 2003; Harcourt, 1998; Sims *et al*., 2002). For example, fear of crime now features in the primary mission statement of the New South Wales (NSW) Police Force, which is to provide "a safe NSW with a respected police force working with the community to reduce violence, crime and fear" (NSW Police, 2004). The Kings Cross Local Area Command (LAC), which has high levels of crime and disorder, has shown particular interest in the latter (Darcy, 2003; Jochelson, 1997; NSW Police, 2004).

This study is set in Kings Cross to build on the police's 2003 fear mapping project, which demonstrated that a majority of respondents felt unsafe in the Kings Cross LAC (Darcy, 2003). The City of Sydney Council is also interested in reducing fear of crime in the Kings Cross area through planning strategies that consider Crime Prevention Through Environmental Design (CPTED) (AJC, 2006; CoSC, 2006i; CoSS, 1997a). However, despite government interest in reducing fear of crime evidence from other

countries suggest that fear reduction strategies are often unsuccessful. This is largely because of a number of problems and inconsistencies within the field of research that have limited the availability, usefulness and application of research findings to fear reduction strategies. It is hoped that the research methods used in this study produce results that are readily available, useful and applicable to future fear reduction plans in Kings Cross.

1.2. A contentious field of research

The potential for fear of crime to become a significant social problem was recognised in the 1960s and it has since been a topic of interest for researchers from a variety of academic disciplines (Farrall, *et al*., 2000; Van der Wuff, *et al*., 1989; Warr, 2000). Criminologists, sociologists, geographers and psychologists all study fear of crime, albeit from slightly alternative perspectives. These perspectives can be categorised into four main groups according to the type of factors that are hypothesised to explain fear of crime. The four groups are identified in this thesis as the 'criminal opportunity and risk of victimisation', 'demographic', 'social' and 'environmental' theories.

The criminal opportunity and risk of victimisation hypotheses propose that fear of crime is directly related to actual risk of crime. The demographic theories look to socio-demographic characteristics when explaining fear of crime and include the victimisation, indirect-victimisation and vulnerabilities hypotheses. The social theories look to qualities of the social neighbourhood, other than crime, when explaining fear of crime. These include the risk society, social disorganisation, sub-cultural diversity, social integration, community concern, and social change hypotheses. While the majority of fear of crime studies have examined fear of crime through the demographic or social theories, these hypotheses remain contested. They also provide results that can be difficult to incorporate into fear reduction strategies.

The environmental theories look to the external characteristics of one's environment when explaining fear of crime. They include the disorder/incivilities, signal crimes and threatening environments hypotheses. The disorder/incivilities

hypothesis proposes that people feel afraid of crime when they encounter signs of disorder or incivility in their environment. Incivilities generate fear because they signify a lack of order, the presence of crime or threat of victimisation (Mirrlees-Black & Allen, 1998 in Pantazis, 2000; Tulloch, 2000; Ross & Mirowsky, 1999). The signal crimes perspective extends the disorder/incivilities hypothesis. It concentrates on how and why different incivilities have a disproportionate impact on how people interpret them, and the extent that they connote criminogenic risk (Innes & Fielding, 2002; Innes, 2004). The threatening environments hypothesis expands further to acknowledge that fear of crime can still be triggered in environments where there is no crime or disorder. The hypothesis argues that environments can generate fear of crime simply because they are considered to be attractive sites for criminal activity.

This research is largely conducted from a geographer's perspective and draws on the environmental theories to examine fear of crime. This study explores how disorder, incivility, signal crimes and threatening environments, categorised under the heading of 'environmental cues', trigger fear of crime. Because environmental cues can be managed and targeted by police and council through CPTED, the findings from studies examining fear of crime through these environmental theories can have real implications for the design of fear reduction strategies.

1.2.1. Defining fear of crime

With such a variety of research perspectives and hypotheses to test, fear of crime research has been dominated by conceptual ambiguity and contention when defining, measuring and analysing fear of crime (Ferraro & LaGrange, 2000). Despite an abundance of studies, researchers infrequently define fear of crime. When they do, it is with reference to a broad range of emotions, perceptions of risk, concerns and judgements (Ferraro & LaGrange, 1988; Ferraro & LaGrange, 2000; Skogan, 1999; Rountree & Land, 1996). With contradictory conceptualisations of fear of crime, researchers have approached their investigations from vastly different viewpoints and used heterogenous research methods. Comparison of project findings is therefore exceedingly troublesome, akin to contrasting the results from studies on entirely different subject matters. It is therefore not surprising that fear of crime research results and findings have been inconsistent and often conflicting (Skogan, 1999). The diversity

of findings emphasises that, regardless of point of view, researchers need to explicitly state how they conceptualise and define fear of crime. Fear of crime must also be unequivocally defined so that the research approach can be tailored towards that particular conceptualisation, thereby curbing the possibility of any vagueness in the interpretation of research results.

This study employs Ferraro's (1995) definition of fear of crime as an "emotional response of dread or anxiety to crime or symbols that a person associates with crime". This study defines crime as a violation of criminal law, and the symbols associated with crime as those signs that feature in the environmental fear of crime theories.

1.2.2. Measuring fear of crime

One of the most important aspects of the research design for fear of crime studies is in the approach used to measure fear of crime. There is much debate in the literature regarding the most appropriate method to do this, a problem that is exacerbated by the conceptual uncertainties and conflicts in defining fear of crime. Traditionally fear of crime is measured using cognitive and affective approaches. Cognitive approaches measure what people think about risk and safety in general, rather than their genuine feelings of fear of crime (Ferraro & LaGrange, 1988; Pantazis, 2000). However, perceptions of risk differ from feelings of fear (Ferraro & LaGrange, 2000b). Perceptions of risk and feelings of fear also vary according to the type of crime under consideration, and consequently the general findings from cognitive approaches are critised as being useful for only broad level analyses. Affective approaches do measure people's fear of a specific crime, yet result in vague and subjective responses that are difficult to compare (Ferraro & LaGrange, 2000b). Depending on the conceptual definition of fear of crime and objectives of the study, the research utility of these approaches is also limited to certain contexts.

Behavioural approaches are increasing in popularity and the benefits of this measurement approach are becoming better understood. Behavioural approaches to measuring fear of crime examine the protective actions and avoidance strategies adopted by people attempting to reduce their fear (Gabriel & Greve, 2003; Samuels & Judd, 2002; Tulloch, 2000). These behaviours cannot only be compared more reliably

than emotional or cognitive statements, but also provide insight into how fear of crime affects individuals and the community. Given this, examining fear of crime through avoidance is especially pertinent because avoidance is a common and significant response that can cause problems for affected neighbourhoods, as previously mentioned. A particular benefit is that by illustrating avoided areas on a map, the spatiality of fear of crime can also be investigated (Doran & Lees, 2003; Nasar *et al*., 1993; Nasar & Jones, 1997). This allows more accurate comparison of responses and arguably more targeted policy responses.

However, studies measuring fear of crime through avoidance have generally been trapped within the traditional framework, looking at areas people avoid because they feel unsafe, rather than afraid of a specific type of crime. This research adopts a crime specific approach to measuring fear of crime through people's avoidance strategies. It specifically examines the patterns of avoidance adopted by people who fear being robbed, beaten or attacked.

1.2.3. Analysing fear of crime

With the assortment of cognitive, affective and behavioural approaches to measuring fear of crime it is no wonder studies result in different findings. Progress and consistency in this area of fear of crime research is also clearly needed, preferably with the adoption of behavioural measures. However, regardless of the conceptual definition of fear of crime and measurement approach employed by the researcher, analytical inconsistencies have further besieged fear of crime research. A variety of statistical models, both bivariate and multivariate, have been used to analyse the sample data in fear of crime studies. While the statistical models themselves are not criticised, they have caused contention in the field due to inconsistency of methods. A lack of analytical constancy has compounded the fact that fear of crime studies have produced conflicting or dissonant results, even when examining the same dataset (LaGrange & Ferraro, 1989). This has further made comparison of results problematic. Additionally, such traditional analyses are generally aspatial, failing to present a clear geographic frame of reference to the survey respondents. This has limited their usefulness in providing strategic information that can be used to direct resources for the reduction of fear of crime.

Avoidance mapping has the potential to provide more information than the traditionally used statistical analyses. The visualisation of spatial data through mapping facilitates the identification of spatial patterns or relationships within that data (Kwan, 2000; Ratcliffe & McCullagh, 2001). Avoidance mapping can therefore highlight any clear spatial elements to public fear of crime. While being able to conduct many of the traditional statistical analyses on the sample data, avoidance mapping can also reveal the temporal nature and scope of feared areas, allowing them to be investigated in greater detail to determine why they evoke fear. This information is particularly useful for operational policing as it allows the targeting of resources to those areas most at need. Similarly, councils can determine which areas have a priority for development and which environmental cues should be designed out of the setting. Mapping also permits comparison of avoided areas in order to spatially investigate which socio-demographic groups are more likely to adopt avoidance strategies in response to fear of crime.

Despite the clear benefits of mapping, few researchers have provided their survey respondents a geographic frame of reference, whether it be a map or otherwise, to conduct spatial analyses. A handful of researchers have pioneered the use of fear mapping and produced some highly informative results, however the scope of their success has been constrained by a number of factors. For instance, the fear mapping projects have also been limited by their data visualisation techniques. Problems have predominately arisen with the methods used to the combine individual fear maps into an aggregate avoidance map and display the data in an informative manner. This study develops a three-dimensional visual-diagnostic mapping technique to overcome these problems. The resulting avoidance maps allow an examination of areas that people avoid because they are afraid of being robbed, beaten or attacked. They also facilitate an exploration into the environmental cues that trigger people to feel afraid and avoid these areas. By applying these research methods, the study aims to investigate the capacity fear mapping has for providing new and useful information that is not revealed through traditional cognitive statistical studies.

1.3. Thesis outline

This thesis consists of twelve chapters. The introduction chapter summarises the motivation for this project. It provides a brief outline of the related literature and research approach. The second chapter provides a more in depth literature review drawing on different theoretical and practical debates within criminology. The third chapter draws on the literature review to describe the research approach adopted in this study. The next three chapters describe the research methods, respectively focussing on the research setting, survey design and implementation, and the avoidance mapping technique. Three results chapters follow these methods. The sample characteristics are presented first, using non-spatial methods. The results from the spatial visualisation of fear of crime, using a 2D mapping technique, are presented in the second results chapter. These 2D avoidance mapping results are discussed in another chapter, before the last results chapter. The last results chapter presents the final avoidance maps, which use a 3D visualisation technique to show areas people avoid because their fear of crime is triggered by specific environmental cues. Chapter eleven discusses these results in light of the literature and their implications for practice and policy. Finally, the last chapter concludes the thesis and outlines directions for future research.

2. Literature Review

This chapter will review the fear of crime literature, paying attention to:

- the difficulties in defining fear of crime (section 2.1),
- the various factors associated with fear of crime (section 2.2),
- fear of crime as a social problem (section 2.3),
- approaches to combat fear of crime(section 2.4), and
- the different methodologies for investigating fear of crime (section 2.5).

2.1. Difficulties defining fear of crime

While fear of crime is easily interpreted during everyday discourse, it needs to be defined for research purposes (Skogan, 1999). The conceptual definition of fear of crime has clear consequences for its operationalisation. Which in turn impacts how research results and findings are interpreted (Skogan, 1999). The definition of fear of crime must therefore be clarified before investigations can be conducted and validly compared (Ferraro & LaGrange, 2000). This section reviews how, or whether, researchers define fear of crime, beginning by discussing the conceptual confusions in doing so. It outlines how researchers view the 'fear' in 'fear of crime' as either an emotional reaction or a cognitive assessment. It describes how fear is distinct from other emotions, and why this distinction is important. It then discusses how the 'crime' in 'fear of crime' is subject to contention. Lastly, it expands on the various types of fear of crime relative to the definition of crime.

2.1.1. Conceptual confusion in defining fear of crime

Prior to 1980, researchers rarely explicitly defined fear of crime (Yin, 1980). Yin (1980) found only Sundeen and Mathieu's (1976) definition of fear of crime in his comprehensive review of literature. Sundeen and Mathieu (1976) define fear of crime as "anxiety and concern that persons have of becoming a victim". Five years layer,

Garofalo (1981) defined fear of crime as an emotional reaction characterised by a sense of danger and anxiety, produced by the threat of harm. By 1984, Warr (1984) stated fear of crime had "acquired so many diverging meanings in the literature that it is in danger of losing any specificity whatsoever" (Ferraro & LaGrange, 1988). This problem was such that the concept of fear of crime and its research utility was considered 'negligible' (Ferraro & LaGrange, 1987). Comments such as this have continued well into the 1990s (Ewald, 2000; Stanko, 2000).

Despite an abundance of studies on the topic, the literature still exhibits confusion and ambiguity when defining fear of crime (Pantazis, 2000; Warr, 2000). Fear of crime is equated with a diverging array of emotions, insecurities, concerns, perceptions or judgements, and attitudes or values (see Ditton, *et al*., 2000; Ferraro & LaGrange, 2000; Furstenberg, 2000; Mawby, *et al*., 2000; Warr, 2000). In order to define fear of crime, a strategy is needed to systematically unpack the concept (Ditton *et al*., 2000). This thesis does so by not only examining the concept of 'fear of crime' as a whole, but also by examining the individual terms 'fear' and 'crime'. It firstly draws upon and refines the most commonly used definition, which considers fear of crime as "the negative emotional reactions generated by crime or symbols associated with crime" (Ferraro & LaGrange, 1987).

2.1.2. Fear is an emotion, not a cognition

Much of the debate and confusion surrounding the concept of fear of crime arises from a failure to distinguish between emotion (what we feel) and cognition (what we think) (Ferraro, 1995; Warr, 2000). Defining fear as an emotion is therefore important because, although related, emotive and cognitive responses to crime are conceptually different. Thus studies confusing the two states could have markedly dissonant results that cannot validly be compared (Ferraro & LaGrange, 2000; Rountree & Land, 1996). According to Ferraro and LaGrange's (1987) definition, fear of crime consists of "the negative emotional reactions" [emphasis added]. Emotion is a distinctive mental state, a feeling state, which includes physical responses that prompt or restrain motivated behaviour (Carlson & Hatfield, 1992).

However, in contrast some researchers view fear of crime as a cognitive assessment. Cognitive assessments encompass people's judgements about crime, their evaluation of personal risk (perceived risk)[1] and their general concern about crime (Skogan, 1999). Ferraro (1995) defines perceived risk as an acknowledgement of potential danger, real or imagined. This danger involves exposure to the chance of injury or loss (Ferraro, 1995). Assessments of risk are associated with perceptions of the probability of victimisation, and with 'fear of crime'[2] (Ferraro & LaGrange, 2000; Skogan, 1999). However, a number of studies clarify the distinction between perceived risk and fear of crime, finding that they are related to different predictors (Mesch, 2000).

Researchers also define fear of crime as a concern or worry about crime, which can be referred to as a value (Ferraro & LaGrange, 2000). However, concern is not linked to fear, but to a state of agitation regarding the level of crime in one's environment and a belief that crime is a serious social problem (Furstenberg, 1971; Oc & Tiesdell, 1997). This is also distinct from the previously mentioned perceptions of risk or threat.[3] With these contrasting meanings, distinguishing between fear (an emotion) and either risk, concern or worry, helps validate fear of crime studies (Lewis & Salem, 1986).

2.1.3. Fear is distinct from other emotional reactions

Ferraro and LaGrange's (1987) definition of fear as an emotion fails to distinguish fear from other emotional reactions, like sadness, anger or despair (Warr, 2000). Some researchers recognise that many surveys aimed at examining fear of crime are actually tapping into other emotions (Innes & Fielding, 2002; Innes, 2004). Farrall and Ditton (1999) argue that respondents are more likely to feel anger, outrage or annoyance rather than fear when thinking about crime. Thus distinguishing fear from these other

[1] Risk is closely related to perceived threat of crime. Where perceptions of risk refer to actual rates of victimisation, threat refers to how at danger one personally is of being victimised. This accounts for strategies adopted to reduce one's vulnerability. Vulnerability is discussed later in the chapter (Skogan, 1999).
[2] Many researchers agree perceived risk is an important component of fear of crime, and are often its strongest predictor (Ferraro, 1995; Warr 1985; Warr, 2000; Reid *et al*., 1998).
[3] For example with property crime, people can be more concerned than fearful because the threat of physical harm is low compared to personal crime (Garofalo, 1981). Similarly, worry about crime may be reduced by behavioural changes without impacting on fear (Tulloch *et al*., 1998).

emotions is important when comparing the potentially discordant results from fear of crime studies. This also reinforces the need to succinctly define and target fear in this study.

Essentially, fear[4] is an emotion that describes feelings of alarm, dread or apprehension about tangible or perceived threats (Clark, 2003; Innes, 2004; Sluckin 1979). Thus, fear is an emotion characterised by an expectation of danger that is produced by the threat of harm (Dickinson & Williams, 1993; Sluckin, 1979). Fear forewarns danger, promoting vigilance and a fight or flight response (Carlson & Hatfield, 1992; Oatley & Jenkins, 1996). Different objects or stimuli can trigger fear, as discussed next.

2.1.4. Fear triggered by the threat of crime

Fear is determined by the object or stimulus that is expected to cause harm (Warr, 2000). Warr explains that fear of crime is not qualitatively different from other forms of fear. However, it is important to elucidate what makes fear of crime distinct from other forms of fear. This is due to numerous problems, discussed later in section 2.2.3, arising from studies tapping into people's diffuse or 'formless'[5] feelings of fear, rather than specific or 'concrete'[6] fear of crime. Fear of crime is specifically the fear of being harmed during criminal victimisation and it is generated by crime or symbols associated with crime (Warr, 2000). These symbols can be thought of as environmental cues that relate to some aspect of crime (Williams & Dickinson, 1993).

Fear may be aroused by immediate danger, for example an armed attacker, but is often experienced as anticipating a potential threat (Carlson & Hatfield, 1992; Kaplan, 1973). This occurs when people react to environmental cues that imply danger because they are associated with crime (Garofalo, 1981; Warr, 2000). Psychologists identify the emotional reaction to potential threats as anxiety (Clark, 2003). Warr (1994) reasons that anxiety is much more common than fear associated with real encounters of crime

[4] Fear is one of the primary emotions essential to survival (Neill, 2001). This is because fear prompts one to protect oneself when confronted by risk (Clark, 2003).
[5] Formless fear is a non-specific anxiety (Friedberg *et al*., 1983).
[6] Concrete fear is the fear of becoming the victim of a specific crime (Friedberg *et al*., 1983).

(Warr, 2000). Garofalo (1981) also states that behavioural changes can result from such anticipatory fear. This perhaps prompted Ferraro's (1995) amended definition of fear of crime as an "emotional response of *dread* or *anxiety* to *crime* or *symbols* that a person *associated with crime*" [emphasis added]. This is the conceptual definition of fear of crime that is consequently used in this thesis. However, with the 'crime' in 'fear of crime' also subject to contention, the difficulty in defining fear of crime continues.

2.1.5. Crime involves a violation of criminal law

The term 'crime' has escaped definition in much of the criminological literature, with many studies presuming crime is self-explanatory (Ewald, 2000). However, how people conceive crime influences their response to fear of crime survey questions. Defining crime is therefore a necessary component when defining 'fear of crime'. Nevertheless, even when crime is defined opposing theoretical approaches lead to contention (Sparks *et al*., 2001). The two mainstream legal and social definitions of crime are touched on here.[7]

Traditional jurisprudential definitions of crime describe it as an act in violation of criminal law. For example, Reiss (1986) defines crime as "an event or sequence of events in time and space that violates the criminal statute". Criminal law, or statute, represents those norms of conduct within a society that are intended to influence, regulate and guide the behaviour of the public (Potas, 1996). However, these social norms are formalised and enforced by a political authority through legislature and the courts (Potas, 1996; Sutherland & Cressey, 1970).[8] Therefore, as Stephen (1883) states, crime also becomes an "act or omission in respect of which legal punishment may be inflicted" (cited in Walsh & Poole, 1983).

[7] However, there are many more approaches to defining crime (see: Vold *et al*., 2002; Walsh & Poole, 1983; White & Haines, 2004).

[8] Other schools of thought highlight that the definition of crime reflects the social and political processes whereby certain actions are subjected to criminalisation (Oc & Tiesdell, 1997). This prompts questions concerning social control. As crime is dependent on those with the power to label, it can be used to censure certain groups of people (Oc & Tiesdell, 1997). The legal definition of acceptable behaviour can be modified should public concern be acknowledged. An example is example the introduction of bylaws outlawing the consumption of alcohol in public spaces (Oc & Tiesdell, 1997).

In contrast, social perspectives of crime propose that crimes are violations of any social code, whether defined by criminal law or not (Jeffery, 1971). These social codes or 'laws of morality' also guide public behaviour, however are not traceable to a single universally recognised rule-making institution that can enforce them through sanctions for disobedience (Potas, 1996). As social norms of conduct characterise crime, this definition includes many acts not usually regarded as legally criminal, such as drug addiction and prostitution (Jeffery, 1971). The social concept of crime ties in most with the general public's viewpoint. It is often these acts of disorder, rather than legally defined crimes, that cause fear of crime (Oc & Tiesdell, 1997). Clarifying Ferraro's (1995) fear of crime definition, 'crime' in this study is seen as a violation of criminal law, yet it is acknowledged that the threat of crime can be triggered by acts of disorder that infringe only social norms.

Some researchers contend the fear of crime examined in numerous studies is not actually a fear of 'crime' in this sense. These social theorists, discussed in section 2.2.3, conclude that fear of crime is actually an underlying formless fear caused by different societal problems (Lane & Meeker, 2003). Bearing this in mind, researchers must be vigilant to target fear of actual, legally defined 'crime' when devising survey questions. The relationship between fear of crime and a number of different variables proposed by these social theories are discussed in the following section on 'factors associated with fear of crime'. Before doing so, it is necessary to note that crime, in its everyday sense, can be delineated by type, subject of victimization and fear.

2.1.6. Types of fear of crime

Rountree and Land (1996) state researchers generally overlook the differences between types of fear of crime. Two dimensions of fear of crime are identified. The first concerns the type of victimization (personal or property). This distinction is relevant because levels of fear vary according to whether the threat of harm from victimisation is targeted on one's person or property (Garofalo, 1981). Therefore it is essential that the type of victimisation (personal or property) be specified in fear of crime studies. The second dimension concerns the subject of victimisation (personal or altruistic). Warr (2000) contends that individuals may not only fear for their own personal safety when in a dangerous environment, but for the safety of other

individuals. This is known as altruistic fear. It is likely that altruistic fear extends to those outside of the household to family and friends, or even to the public at large (Warr, 2000). Nevertheless, it is also necessary that researchers distinguish personal fear (fear for oneself) from altruistic fear (fear for others) in their investigations. Refining the various types of victimisation in this way has lead to some improved results (Lewis & Salem, 1986).

2.1.7. Section synopsis: Fear of crime can be defined

Historically, researchers have failed to succinctly define 'fear' and 'crime'. Conceptual confusion has arisen when researchers do not define fear of crime and assume it is commonly comprehended. This section highlighted the problems of defining 'fear' and 'crime'. Drawing from the literature, it is recommended that fear of crime be thought of by:

- defining fear as an emotion, not a cognition;
- recognising fear is distinct from other emotions;
- distinguishing fear triggered by the threat of crime from formless fear;
- focussing on fear of crime that involves a violation of criminal law;
- acknowledging fear of crime can be triggered by violations of social norms, known as acts of disorder; and
- being mindful of the different types of fear of crime.

In doing this, researchers can define and operationalise fear of crime, tailoring their research design appropriately to ensure valid results. They can then confidently compare their findings with those obtained in other studies. Fear of crime findings are frequently the result of an investigation into the factors associated with fear of crime. These factors are discussed in the next section.

2.2. Factors associated with fear of crime

Knowledge of the factors associated with fear of crime is imperative for fear reduction strategies. To effectively combat fear of crime planners and policy makers need this knowledge to ascertain why people feel afraid. There are four streams of theoretical research that propose factors linked with fear of crime. These can be grouped as the 'criminal opportunity and risk of victimisation' theories, the 'demographic' theories, 'social' theories and 'environmental' theories. The criminal opportunity and risk of victimisation theories focus on crime as the chief explanatory variable in fear of crime. The demographic theories focus on different socio-demographic groups as the primary unit of analysis in examining those factors associated with fear of crime (Innes, 2004). The social and environmental theories look to cues in the external environment as factors that trigger fear of crime.

2.2.1. Criminal opportunity and risk of victimisation theories

While Cohen and Felson's (1979) routine activities hypothesis, also known as the criminal opportunity or risk of victimisation hypothesis, was developed to explain where and when people engage in crime, it is also adapted to assist understandings of fear of crime (Ferraro, 1995). It proposes that rationally motivated offenders commit crime when opportunities, in space and time, provide a potential victim and an absence of capable guardians (Cohen & Felson, 1979). These opportunities are systematically related to the routine activities of the potential victims and their guardians[9] (Cohen & Felson, 1979). Variation in routine activities differentially place people at risk of victimisation by structuring their convergence in time and space with motivated offenders (Cohen & Felson, 1979). This convergence increases their likelihood of victimisation[10] (Cohen & Felson, 1979).

As offenders assess environments to increase their opportunity for crime, so can potential victims reflect these judgements when defining places and times as risky or

[9] See also: Bursik, 1988; Cochran *et al*., 2000; Vold *et al*., 2002; Walklate, 2003)

[10] Criminal opportunity theory branches into numerous related theories focusing on routine activities affecting people's risk of victimisation. For example Clarke (1980) and Cornish and Clarke (1986) propose the rational choice theory. Similarly, Meithe and Meier (1990) proposes the structural choice theory.

threatening (Brantingham & Brantingham, 1993; Ferraro, 1995). When applied in conjunction with micro-scale perspectives, such as symbolic interactionism, criminal opportunity hypotheses facilitate analyses seeking to explain the spatial and temporal distribution of fear of crime[11] (Ferraro, 1995). However, multiple studies concur that fear of crime, and people's perception of risk of victimisation, far exceed the reality of actual crime rates and levels. This applies even when assuming a liberal amount of unreported crime (Liska, *et al*., 1988; Painter, 1996; Taylor & Hale, 1986). Fear of crime thus appears out of proportion to the objective risks of victimisation (Warr, 2000). This occurs across the world, including Australia[12]. Thus it is paramount that researchers hoping to influence the design of fear reduction strategies investigate other potential factors associated with fear of crime. The first of these factors relate to characteristics of those demographic groups experiencing fear of crime.

2.2.2. Demographic theories explaining fear of crime

The demographic theories have dominated fear of crime research since its conception (Farrall, 2000). They examine whether people's fear of crime is associated with their experiences of crime or feelings of vulnerability. Ultimately, each demographic hypothesis explains why some socio-demographic groups are more afraid of crime than others. This knowledge is important in providing an understanding of the nature of public fear of crime, which is valuable for fear combating strategies. The group of demographic theories is comprised of the victimisation hypothesis, indirect-victimisation hypothesis and vulnerabilities hypothesis.

2.2.2.1. Victimisation hypothesis

The victimisation hypothesis indicates a positive relationship between direct experience of victimisation and fear of crime (Crank *et al*., 2003; Skogan & Maxfield, 1981). Direct victimisation recognises only those victims who have been directly

[11] For example, the micro-scale environmental cues and the wider macro-scale structural and geographic influences are taken into account (Ferraro, 1995).
[12] See: Byrne, 1999; Cornell, 2002; Brantigham *et al*., 1997; Cozens, 2002; Liska *et al*., 1988; Clark, 1989; Macken, 25/7/1998; Miceli *et al*., 2004; Nelson *et al*., 2001; Smith, 1997; Taylor & Hale, 1986; Tulloch *et al*., 1998; and Totaro, 1988.

affected by the actions of an offender or incur some immediate loss following a victimisation (Clark, 2003; Mesch, 2000). Under the victimisation hypothesis, previous experiences of direct victimisation increase one's sensitivity to risk. The emotional losses victims endure following criminal victimisation create a new sense of personal vulnerability, which results in increased fear of crime (Clark 2003).[13] Additionally, Clark comments that victimisation can cause confusion, shock, helplessness, fear, anxiety and even depression and post-traumatic stress disorder.[14] Past victims would therefore have an increased likelihood of perceiving greater risks of victimisation (Mesch, 2000).

A multitude of studies have investigated the victimisation hypothesis, with different studies obtaining different results (Borooah & Carcach, 1997). Numerous studies find a positive relationship between experience of victimisation and fear of crime (Crank *et al*., 2003).[15] In contrast, there are studies that either fail to find an association[16], or indeed find a negative association, between victimisation and fear (Evans & Fletcher, 2000). Regardless, as the victimisation hypothesis makes intuitive sense few researchers are able to elucidate why previous victims of crime may not be afraid of crime (Crank *et al*., 2003; Katz *et al*., 2003).[17] This type of information could potentially be useful in fear reduction strategies. However overall, the mixed results prompt researchers to conclude there is little evidence to support the victimisation hypothesis (Katz *et al*., 2003). The victimisation hypothesis thus remains unsubstantiated (Borooah & Carcach, 1997).[18]

---

[13] Vulnerability increases due to Janoff-Bulman's (1985) three emotional losses. Firstly there is a desecration in beliefs of personal invulnerability, that victimisation "won't happen to me". Secondly, the belief in the 'social law' that "good people do not get hurt" is defeated. Lastly, is a loss of one's self-worth, as victims "recognise their self limitations, powerlessness, helplessness and neediness" (cited in Clark, 2003). Societal attributions of victim blaming also result in decreased trust in oneself and others (Clark, 2003).

[14] In this sense, the victimisation is related to the vulnerabilities and the indirect-victimisation theory, which are discussed later in this section.

[15] Of these, many confirm a strong and direct relationship in support of the theory (see: Akers *et al*., 1987; Cates *et al*., 2003; Ferraro, 1995; Katz *et al*., 2003; Smith & Hill, 1991; Skogan, 1990). Others find only a positive but weak relationship exists (see: Akers *et al*., 1987; Cates, *et al*., 2003; Evans & Fletcher, 2000; Garofalo, 1979; Katz *et al*., 2003; Liska *et al*., 1988).

[16] See: Borooah & Carcach, 1997; Rader, 2004.

[17] Victims could neutralise fear of crime by employing denial techniques or accepting responsibility (Katz *et al*., 2003). Similarly, their sensitivity to fear could be reduced by rebuilding their views of the world and themselves (Clark, 2003).

[18] Surveying methods and measures could also account for conflicting results. For example different surveys investigate different periods of previous victimisation (Gray & O'Connor, 1990; Akers *et al*., 1987; Evans & Fletcher, 2000).

2.2.2.2. Indirect-victimisation hypothesis

The indirect-victimisation hypothesis accounts for the host of studies that find 'non-victims' also experience fear of crime. The indirect-victimisation hypothesis recognises people can experience victimisation vicariously. People may experience the same emotions that result from a direct victimisation, when they hear of others' crime encounters (Clark, 2003; Hanson *et al*., 2000). The signal crimes perspective, discussed later, even suggests that crime and disorder have the same effect regardless of whether they are encountered in person or indirectly (Innes &Fielding, 2002).[19] Indirect-victimisation research focuses on how crime information is obtained. Findings point towards exposure to crime through media accounts and interpersonal communication (Rountree & Land, 1996).

Numerous studies suggest that fear of crime is a product of media exposure (Killias & Clerici, 2000; Romer *et al*., 2003; Weitzer & Kubrin, 2004). Researchers supporting indirect-victimisation through the media have taken a number of different approaches. These are known as the cultivation[20], substitution[21], resonance[22], social-comparison[23] and interpersonal-diffusion[24] hypotheses. Overall, they argue the media exacerbates perceptions of risk of victimisation, and therefore induces fear of crime (Lane & Meeker, 2003). In contrast, some researchers discredit the link between media exposure and fear of crime (Lane & Meeker, 2003; Romer *et al*., 2003). Other researchers find

[19] The signal crimes theory names directly encountered crimes 'situated signal crimes' and indirectly encountered crimes 'disembedded signal crimes (Innes &Fielding, 2002).
[20] Cultivation theorists argue the media portrays an unrealistic world rife with crime, thereby fostering perceptions of increased risk and provoking fear of crime. The cultivation thesis argues media crime coverage has a uniform effect regardless of the audience (see: Heath & Gilbert, 1996; Jopson, 2/6/1995; Lupton & Tulloch, 1999; Romer *et al*., 2003; Skogan & Maxfield, 1981; Totaro, 1988; Tulloch, 2000; Weitzer & Kubrin, 2004; Williams & Dickinson, 1993).
[21] In contrast, the substitution thesis suggests audience characteristics and contextual differences affect the impact of media on fear of crime. It propounds media exposure has a greater influence on fear of crime experienced by non-victims than victims (see: Chiricos *et al*, 1997; Heath & Gilbert, 1996; Kubrin, 2004; Lane & Meeker, 2003; Weitzer & Kubrin, 2004).
[22] The resonance thesis, whilst also acknowledging the media affects audiences differently, expects the opposite reaction to the cultivation thesis. It considers the media influences fear of crime only when the crime coverage resonates with crime experiences of the audience, acting to mutually reinforce present feelings of fear (Weitzer & Kubrin, 2004).
[23] In line with the resonance thesis, the social-comparison thesis focuses on crime coverage pertinent to the audience's locality. It proposes that crime reported in one's neighbourhood fosters fear of crime, whereas crime reported in remote areas does not (Romer *et al*., 2003).
[24] The interpersonal-diffusion thesis also reflects the regional relevance of crime reports. It argues fear of crime is amplified when crime accounts resonate with the audience's direct or indirect experiences of victimisation. Only when media reports are compounded with other local sources of information about crime, is fear of crime increased (Romer *et al*., 2003).

no relationship between fear of crime and the media when demographic characteristics or neighbourhood levels of crime are examined (Katz *et al*., 2003).[25]

The second element of the indirect-victimisation hypothesis focuses on the relationship between interpersonal communication, rather than the media, and fear of crime. The interpersonal communication hypothesis assumes that knowledge of others' experience of criminal victimisation spreads throughout a community's social networks (Mawby *et al*., 2000; Taylor & Hale, 1986). It is presumed that knowledge about crime through interpersonal communication adds a crime multiplier and therefore perceptions of risk and fear of victimisation are increased (Taylor & Hale, 1986).[26] Generally, researchers find that there is a stronger relationship between fear of crime and indirect-victimisation than direct victimisation (Katz *et al*., 2003).[27] Skogan and Maxfield (1981) conclude that this may be because indirect-victimisation is more common and widespread than direct victimisation. Adding to this, many cultural geographers note that certain areas of a neighbourhood are feared because of their reputation. This is considered a consequence of interpersonal communication (Gardener, 1990; Smith, 1985; Koskela & Pain, 2000). Ferraro (1995) argues that indirect victimisation has a strong effect on constrained behaviour in such areas (Ewald, 2000).

2.2.2.3. Vulnerabilities hypothesis

Following on from the indirect-victimisation thesis, the vulnerabilities hypothesis explains the common assumption that different socio-demographic groups experience different levels of fear of crime and exhibit this fear differently (Warr, 2000; Liska *et*

[25] Supporters of the real-world thesis argue that fear of crime is more a result of objective conditions including personal victimisation, actual crime rates and neighbourhood characteristics, than sensationalist stories reported by the media (Chiricos *et al*., 2000; Lupton & Tulloch, 1999; Weitzer & Kubrin, 2004). Additionally the operationalisation and measurement of fear of crime can alter the relationship between media exposure and fear of crime (Heath & Gilbert, 1996).

[26] This effect is maximised for people who are well entrenched in social networks (Crank *et al*., 2003; Lewis & Slalem, 1986; Skogan & Maxfield, 1981).

[27] The fear of crime response may be greater via indirect victimisation because hearing about crime stimulates the imagination whilst ignoring the necessity for coping strategies (Katz *et al*., 2003). It is also likely these stories are about local events and local victims, therefore being more personal for those hearing about them. This consequently has a greater effect on their fear of crime (Skogan & Maxfield, 1981). Once indirect knowledge about victimisation is obtained, fear of crime is also unlikely to dissipate rapidly (Taylor & Hale, 1986). See also: Clark, 2003; and Lewis & Slalem, 1986).

al., 1988).[28] The vulnerabilities hypothesis also explains two other trends. After taking the risk of victimisation into account, countless studies conclude that those typically fearful socio-demographic groups, like women and the elderly, are the least likely to be victimised (Katz *et al*., 2003; Painter, 1996; Pantazis, 2000; Taylor & Hale, 1986). Vulnerabilities are used to account for this discrepancy and its converse. The converse is that there is apparently a lower-than-warranted fear of crime in some groups, such as young men, who have greater actual risks of victimisation (Katz *et al*., 2003; Lane & Meeker, 2003).

Stinchcombe (1977) first introduced the concept of vulnerability. Perloff (1983) later defines it as "a belief that one is susceptible to future negative outcomes and unprotected from danger or misfortune". Vulnerability is determined by three major factors, namely exposure to risk, loss of control, and seriousness of consequences (Killias,1990). Essentially it is not based on objective threat, yet occurs if one perceives they are vulnerable to criminal victimisation (Katz *et al*., 2003). The concept of vulnerability highlights the importance of including anticipatory fear, anxiety, in fear of crime research (Sacco & Glackman, 1987). It also explains that fear of crime, in contrast to perceived risk, depends on one's perception of the seriousness of a particular offence and one's risk sensitivity to it (Cates *et al*., 2003; Mesch, 2000; Winkel, 1998).[29]

Skogan and Maxfield (1981) distinguish physical vulnerabilities from social vulnerabilities. Physical vulnerability refers to one's perception of their susceptibility to attack, ability to resist an attack and ability to recover health following an attack (McCoy *et al*., 1996; Skogan & Maxfield, 1981). Such physical vulnerabilities include health, body size, self-defence capabilities and disabilities. Social vulnerability reflects how a person's position in society differentially affects their exposure to victimisation and their capacity to cope with the consequences of victimisation (McCoy *et al*., 1996; Ortega & Myles, 1987; Skogan & Maxfield, 1981). Social vulnerabilities are a function

[28] In doing so it also explains why different socio-demographic groups can vicariously feel fear of crime. It is therefore closely linked to the indirect-victimisation theory. However, purist vulnerabilities theorists ascertain generalised socio-demographic predictors mask potentially significant individual biographies, which should be considered (Farrall *et al*., 2000; Sacco & Glackman, 1987).

[29] This is mirrored by other researchers like Wurff and Stringer (1988) who argue that fear is "the perception of a threat to some aspect of well-being, concurrent with the feeling of inability to meet the challenge"

of an individual's position in society. They include income, residential status, educational level, ethnic background, living alone, and experiences of victimisation (Skogan & Maxfield, 1981).

2.2.2.4. Topic review: An abundance of contested demographic studies

The demographic theories look at people's experiences of victimisation, indirect-victimisation and their vulnerabilities to explain fear of crime. The demographic theories largely account for the seemingly different levels of fear exhibited by different socio-demographic groups. Despite an abundance of research, the demographic theories remain contested. Thus, additional factors that may be associated with fear of crime are sought. The social theories explaining fear of crime are discussed next.

2.2.3. Social theories explaining fear of crime

Section 2.1.4 alludes to the fact that some researchers argue 'fear of crime' is not a fear of 'crime' but rather a general state of anxiety caused by a change or breakdown of several different societal factors. This section reviews those hypotheses, starting with the two most prominent hypotheses, the risk society and social disorganisation hypotheses. The social disorganisation hypothesis branches into a framework of various independent but inter-related models, which are also discussed (Covington & Taylor, 1991 in Lane & Meeker, 2003). These models include the sub-cultural diversity, social integration, community concern, and social change hypotheses. This research does not test the social theories, and therefore the literature debate is not fully engaged in. However, the social theories are discussed because they attempt to explain fear of crime and are useful for identifying fear combating strategies. Furthermore in order to specifically target and isolate fear of actual 'crime' in their studies, researchers must consider these theories when designing their research approach and consequently in interpreting their research findings.

2.2.3.1. Risk society hypothesis

Drawing upon notions of the 'risk society', fear of crime is conceptualised as an expression of people's wider feelings of insecurity or uncertainty about life. Risk society theorists commonly propose that fear of crime provides an outlet to express general feelings of anxiety that predominate in our everyday lives. While the literature on risk society is extensive, only a few pertinent points are drawn upon here. According to Beck (1986, 1998, 1992), the founder of the hypothesis, and Giddens (1997, 1998), processes of industrialisation produce numerous new, unforseen, unpredictable and uncontrollable risks (Ewald, 2000; Dean, 1999; Lupton, 1999; Tulloch & Lupton, 2003). The risks are extensive, irreversible and affect all individuals regardless of their social position or class (Beck, 1992; Ewald, 2000; Girling *et al*., 2000). Furthermore the risks are incalculable and unsatisfactorily insurable, making them additionally threatening and anticipatory (Beck, 1991; Dean, 1999; Ewald, 2000). According to Beck (1992) a risk society, defined by the statement 'I am afraid', emerges with these risks.

Lianos and Douglas (2000) come to a similar conclusion. They contend present societies are in a state of 'dangerisation'[30]. Dangerisation is portrayed by a continuous detection of potential threats, which ultimately results in fear and anxiety (Lianos & Douglas, 2000).[31] When in a state of dangerisation, the unknown 'other' is perceived as dangerous (Lianos & Douglas, 2000). This person usually operates beyond one's managed territory and possesses differences in their appearance or behaviours. As a result deviance is associated with unknown individuals or groups, who consequently trigger fear and avoidance (Lianos & Douglas, 2000).[32] In turn, the signs and behaviours associated with these groups become automatic indicators of dangerousness (Lianos & Douglas, 2000; Rose, 2000). Beck similarly claims that it is not the risks themselves that cause fear and unease but those people who represent the risks (Beck,

[30] Like Beck's thesis, dangerisation is brought about by a change in institutional control over collective social interaction (Lianos & Douglas, 2000).
[31] Stanko (2000) argues that "we live in an age fought with uncertainty" and Hope and Sparks (2000) continue that "fear reaches down into the unilluminated corners of the inner life".
[32] These 'others' are generally depicted as dangerous in adherence with existing biases and discriminations (Lianos & Douglas, 2000).

1992). The underlying state of anxiety[33] is projected onto other individuals or social groups. Numerous other theorists agree that crime becomes a scapegoat for intangible insecurities and anxieties (Ewald, 2000; Hollway & Jefferson, 2000; Lupton & Tulloch, 1999).[34] In a risk society not only is anxiety a part of everyday life, but so is crime and the threat of crime (Stanko, 2000).[35] Researchers should be aware of this possibility, as it affects fear of crime measurement approaches. Survey questions should therefore be as specific and precise as possible in targeting fear of actual 'crime'. Similarly, survey questions should be specific in targeting 'fear' of, not concern about, crime. This is pertinent to the social disorganisation group of hypotheses, discussed next.

2.2.3.2. Social disorganisation hypothesis

The social disorganisation hypothesis implies that fear of crime reflects concern about the destruction of social organisation. Since its origins in the 1920s and formal naming in 1942 by Shaw and McKay, the social disorganisation hypothesis has dominated criminological perspectives attempting to explain neighbourhood crime (Cochran *et al*., 2000; Sun *et al*., 2004; Taylor & Covington, 1993). While originally focusing on how the destruction of community social organisation can ultimately lead to crime and delinquency, it now encompasses fear of crime within its scope (McKenzie, 1921; Bursik, 1988 Taylor & Covington, 1993). Bursik (1988) defines social disorganisation as "the inability of local communities to realise the common values of their residents or solve community experienced problems". Sampson and Groves (1989) amend this description to include the concept of social control[36], defining social disorganisation as "the inability of a neighbourhood to achieve the common goals of its residents and maintain effective social controls". Social disorganisation hypothesis is

[33] Sparks also supposes that fear is never caused by a specific target (Sparks, 1992). See also: Dammert and Malone, 2003; Hope & Sparks, 2000; Gottfredson, 1984; Mawby *et al*., 2000; Lupton & Tulloch, 1999; Pain, 2000; and Stanko, 2000.

[34] Holloway and Jefferson (2000) argue 'unconscious' anxieties are displaced onto more tangent external threats (Hollway & Jefferson, 2000). They report criminals are easily identifiable targets and thus provide "a repository for anxieties about other fears that are more intractable and are diffuse for the individual" (Lupton & Tulloch, 1999). Ewald (2000) also reckons the psychological experiences associated with victimization, such as feelings of loss of control, are similar to those anxieties of the risk society and therefore crime becomes a suitable scapegoat.

[35] With fear of crime at the forefront of the risk society, the control and prevention of risk becomes a preoccupation of everyday living (Vaughn, 2002; Walklate, 2000).

[36] Social control refers to the "capacity of the society to regulate itself according to the desired principles and values" or the "ability of social groups or institutions to make norms all rules effective" (Janowitz, 1975 and Reiss, 1951 cited respectively in Sampson, 1986).

therefore dependent upon a community having common values and social norms. The inherent proposition underlying these definitions is that community structures affect a community's ability to maintain public order, constrain residents from violating social norms, and therefore fend off crime and fear (Markowitz *et al*., 2001; Taylor & Covington, 1993).

According to the social disorganisation hypothesis, ethnic heterogeneity and rapid population turnover seemingly undermine community structures and the social ties between neighbours (Bursik, 1988; Taylor & Covington, 1993).[37] This in turn reportedly prevents residents from organising collectively to adequately control public antisocial behaviour (Bursik, 1988; McKenzie, 1921; Taylor & Covington, 1993). When residents do not exercise order, disorderly people continue their delinquencies, which eventually escalate in criminal severity (Taylor & Covington, 1993). As social disorganisation is said to lead to crime, it is also said to lead to an accompanying fear of crime. The idea of social disorganisation has been supported in various longitudinal studies (Bursik & Webb, 1982; Markowitz *et al*., 2001; Samspon & Groves, 1989; Sun *et al*., 2004; Taylor & Covington, 1993). These, and other cross-sectional studies, generally suggest that changes in racial composition are most strongly associated with disorder (Taylor & Covington, 1993). However, Samspon and Groves, (1989) argue this research has failed to measure any mediating variables and therefore cannot be used to support the hypothesis. Furthermore, problems associated with empirically testing the imprecise concept means that the social disorganisation hypothesis is rebuked as failing to distinguish between it's causes and consequences (Markowitz *et al*., 2001; Sun *et al*., 2004; Taylor & Covington, 1993).

Nevertheless, the prominence of social disorganisation hypothesis means it should be acknowledged. Furthermore, the presence of the hypothesis indicates fear of crime survey questions should be developed to target fear, so results are not confused with concern about crime or social disorganisation. This would save confusion when interpreting research findings. The same conclusion can be made from the following

[37] A breakdown in familial controls and the presence of unsupervised youth groups are also central to the social disorganisation theory. Due to high residential mobility and concern about the others' values, adults are hesitant to reprimand disorderly youth. Social mistrust also causes withdrawal from seemingly 'nonconforming' families. Residents are anxious that retaliation would result should they attempt to reform and informally control delinquent behaviour (Taylor & Covington, 1993).

discussion of the related sub-cultural diversity, social integration, community concern, and social change hypotheses.

2.2.3.2.a. Sub-cultural diversity hypothesis

The sub-cultural diversity hypothesis proposes that fear of crime results when residents live in close proximity to individuals of differing cultural backgrounds. This was presented by Merry in 1981. Merry theorises the behaviours of those who are racially, ethnically and culturally different are difficult to interpret. When residents cannot understand different behaviors, they become uncertain about and mistrust these 'others'. The residents believe the 'others' have different social values, attitudes and community commitment (Covington & Taylor, 1991; Lane & Meeker, 2003). In the longer term, they are consequently perceived as being dangerous and fear of crime results (Lane & Meeker, 2003; Merry, 1981).[38] Numerous studies support the hypothesis, finding racial diversity is related to increased fear of crime (Chiricos *et al*., 1997; Covington & Taylor, 1991; Lane & Meeker, 2003; Taylor & Covington, 1993).[39] In opposition to the subcultural diversity hypothesis[40], Chiricos, Hogan and Gertz (1997) found that racial composition has no consequence on fear of crime when other relevant factors are controlled. With the sub-cultural diversity hypothesis, fear of crime can be thought of as an "anxiety endangered through the confrontation of difference" (Ditton, 2000).[41] This emphasises that fear of crime survey questions should focus on fear of a specific crime, so results are not confused with anxiety related to diversity.

---

[38] This is considered particularly pertinent in communities with poor social networks (Lane & Meeker, 2003; Merry, 1981).

[39] Katz *et al*. (2003) note the majority of research supporting the subcultural diversity theory use ethnicity or racial heterogeneity to measure cultural background (Katz *et al*., 2003). They argue these measures are less relevant to subcultural diversity than to conflict theory. While similar, conflict theory proposes "the greater the presence of minority populations, the more threatened majority group members will feel" (Blalock, 1967; Katz *et al*., 2003).

[40] As with any of the explanatory theories, the effect of sub-cultural diversity may also be dependent on the measure of fear used. For example, Thompson *et al.* (1992) found that perceived safety was related to racial composition, while fear of being the victim of specific crimes was not.

[41] A variation of the sub-cultural diversity theory posits that fluxes in sub-cultural diversity, as opposed to static sub-cultural diversity, causes residents to perceive their neighbourhood as in a state of disorder and decline (Lane & Meeker, 2003).

2.2.3.2.b. Social integration / neighbourhood cohesion hypotheses

The social integration hypothesis, also known as the neighbourhood cohesion hypothesis, proposes that poor social integration in a community leads to increased fear of crime (Crank *et al*., 2003). Social integration can be considered as "the capacity of the community to exert social control over its members and passersby, thereby enforcing local versions of right and seemly conduct" (Janowitz, 1978 cited in Skogan & Maxfield, 1981). The social integration hypothesis depends upon additional concepts of social support, social capital and collective efficacy. Like many sociological terms these concepts are multifaceted and arguably ill defined. The main descriptions are covered here. Social support refers to the frequency of contact residents have with one another, the amount of help they provide to one another and how satisfied they are with that support (Thompson & Krause, 1998). Social capital relates to social contact through community networks or associations and resident feelings of trust in one another (Lindstrom *et al*., 2003).[42] Collective efficacy concerns the level of cohesion between residents and their willingness to intervene on behalf of the common good (Sampson *et al*., 1997).[43] A number of researchers find that low levels of social integration, social support, social capital and collective efficacy lead to fear of crime (Ballair, 1997; Bursk, 2000; Markowitz *et al*., 2001; Ross & Jag, 2000; Sampson *et al*., 1997). In contrast, Gibson, Zhao, Lovrich and Gaffney (2002) state it is "challenging to derive any definitive conclusions of the effects of social integration on fear of crime".[44] Regardless, the existence of this hypothesis again stresses that fear of crime survey questions should focus on fear of a specific crime, so results are not confused with worry about poor social integration.

[42] Other concepts are even broader and more akin to the concept of social support. Bourdieu (1998) defines "social capital as the product of significant relationships with social others" (in Lindstrom *et al*., 2003). Similarly, social capital has been referred to as the "formal and informal social networks and associations that connect individuals and groups of individuals to each other" (Gilles, 1998 and Putnam, 2000 in Lindstrom *et al*., 2003).

[43] The willingness of residents to intervene for the common good is also related conditions of mutual trust and solidarity among neighbours (Lindstrom *et al*., 2003).

[44] However, in comparing such studies it is important to consider the varying operationlisations of the concepts inherent in the theory and how they are measured (Crank *et al*., 2003)

2.2.3.2.c. Community concern hypothesis

The community concern hypothesis draws upon the disorder/incivilities and disorder and decline hypotheses, discussed shortly. The community concern hypothesis implies that fear of crime represents the opinion that one's community is in a state of decline (Lane & Meeker, 2003b). People become concerned about the vitality, viability and quality of their neighbourhood when they encounter signs of physical and social decay (Taylor & Hale, 1986). They consequently worry that the present problems in their community may worsen and that their community, as a whole, is in a state of decline (Taylor & Hale, 1986). Residents become concerned that their neighbourhood is less safe than it was in the past and consequently feel afraid of crime (Covington & Taylor, 1991; and Merry, 1981; Lane & Meeker, 2003).[45] This temporal component of the community concern hypothesis lends the hypothesis its secondary title, known as the decline model (Lane & Meeker, 2003). Researchers, such as Taylor and Hale (1986) support the community concern hypothesis, finding that concern predicts fear of crime. Once more, this hypothesis suggests that fear of crime survey questions should focus on fear of a specific crime, so results are not confused with concern about neighbourhood decline.

2.2.3.2.d. Social change hypothesis

Furstenburg (1971) first put forward the social change model, which posits that fear of crime occurs in response to rapid social changes. Furstenburg reports that people most disturbed by social change are more concerned about crime (Furstenberg, 1971). According to the hypothesis, fear of crime eventuates when people resent the processes and features of social change, particularly those that denote adjustments to the prevailing status quo (Furstenberg, 1971). These social changes include diversifying racial heterogeneity, a declining economic base, increasing un-employment and high population turnover (Clark, 2003; Furstenberg, 1971). This could accompany shifts in the environment that may disrupt the people's' identification of people and places that are perceived to be risky, which generates more anxiety (Skogan & Maxfield, 1981).

[45] The community concern theory also concludes that this resulting fear of crime is intensified when local social ties are weak (Conklin, 1975 and Covington & Taylor 1991 and Garofalo & Laub 1978 in Lane & Meeker, 2003). Thus the theory is also related to notions of social integration.

Fear of crime therefore becomes a metaphor for resentment and anxiety following social change (Clark, 2003; Pantazis, 2000).[46] Possibly due to the longitudinal nature of this hypothesis, few studies have tested the social change model. While Hunter, Krannich and Smith (2002)[47] have lent some support for the model, Clark (2003) disputes that such research has only maintained the concept of fear of crime as an anxiety response to rapid change (Clark, 2003). Instead drawing upon Lotz's (1979) study, Clark (2003) proposes that it is concern about crime, rather than fear, that correlates with rapid change.[48] This hypothesis reiterates that fear of crime survey questions should focus on fear of a specific crime, so results are not confused with uncertainty arising from social change.

2.2.3.3. Topic review: Unsubstantiated social studies that do not examine 'fear' of 'crime'

The social theories draw attention to how the social fabric of the environment can lead to fear of crime. According to the social theories, fear of crime can reflect:

- feelings of insecurity or uncertainty;
- concerns about the destruction of community social organisation;
- fear of the unknown and the different;
- concerns about poor social integration;
- concerns about communities being in a state of decline;
- concerns arising from rapid social changes.

By suggesting that 'fear of crime' is not always a 'fear' of 'crime', the social theories point out the importance of specifically targeting 'fear' of 'crime' in survey

[46] Taylor further proposes that fear of crime is provoked by "different types of modern risk", a conclusion very similar to those made by risk society theorists (Hollway and Jefferson, 1997 in Clark, 2003). This supports the concept that fear is more akin to a general sense of anxiety (Clark, 2003).

[47] Hunter, Krannich and Smith (2002) found that fear of crime increased during immigrant boom periods. Smith *et al*., (2001) found that during a period of population growth residents are more likely to view the social context as "unpredictable and potentially risky in regard to their perceptions about personal safety from criminal victimisation" (cited in Hunter *et al*., 2002).

[48] Similarly, Lemert (1951) and others have suggested that changes in conditions, rather than the current level of neighbourhood problems, are the most significant bellwether of fear (Skogan & Maxfield, 1981).

questions. The next section of this chapter continues to look at more tangible factors in the environment that can cause fear of crime

2.2.4. Environmental theories explaining fear of crime

The environmental theories focus on cues in the external environment that trigger fear of crime. Essentially, the environmental theories explain why people feel afraid of crime in areas where there is no actual crime. These theories are particularly pertinent to strategies targeting fear of crime, as they indicate factors in the environment that can be altered to potentially reduce fear. The first of the environmental theories is the disorder/incivilities hypothesis, which pioneered this research. The subsequent theories include the threatening and safe environments theories and the signal crimes perspective.

2.2.4.1. The disorder/incivilities hypothesis

The disorder or incivilities hypothesis advises that there is a positive relationship between fear of crime and people's perceptions of the social and physical characteristics of an environment (Crank *et al*., 2003; Millie & Herrington, 2005; Nasar *et al*., 1993; Tulloch, 2000). In particular it is signs of disorder, or visible cues in an environment that signify a lack of order, and trigger fear of crime (Ross & Mirowsky, 1999). According to Wilson (1968), disorder and incivilities are violations of "standards of right and seemly conduct". Originally, fear of crime studies were primarily concerned with criminal acts and actual infractions of law (Phillips & Smith, 2003). However, the disorder/incivilities hypothesis draws attention to those activities and objects that violate norms without violating the law (Ross & Mirowsky, 1999).

Numerous studies reveal that the signs of disorder at the forefront of the public's mind are those that are not legally criminal acts (Phillips & Smith, 2003; Stephens, 1999). More often they include lower-level breaches of community standards or 'soft' crimes that are frequently encountered in everyday life (Carvalho & Lewis, 2003; Millie & Herrington, 2005; Phillips & Smith, 2003; Skogan, 1990). Therefore

incivilities/disorder theorists, including Nasar, Fisher and Grannis (1993), argue that incivilities generate fear of crime in areas where there is no real criminal activity.

Incivilities generate fear because they are perceived to be warning signs of underlying crime and criminal threat (Mirrlees-Black & Allen, 1998; Tulloch, 2000). They indicate a breakdown in social norms of behaviour, and community relinquishment of both formal and informal social controls and support systems (Perkins & Taylor, 1996); Nasar & Jones, 1997; Rountree & Land, 1996; Tulloch, 2000). Disorder highlights the inability of community members to mobilise resources and deal with problems such as crime (Skogan, 1990; Taylor, 1999). This also includes the inability, or neglect, among officers of the state and external agencies to cope with crime (Perkins & Taylor, 1996). An impression of the neighbourhood's vulnerablity to crime is generated, which translates into fear (Painter, 1996; Nasar & Jones, 1997; Rountree & Land, 1996; Taylor & Hale, 1986). Furthermore, incivilities act as warning signals of impending danger because they are associated with things people fear (Skogan & Maxfield, 1981). Thus, the presence of disorder creates increased perceptions of criminogenic risk (Crank *et al*., 2003).[49] The disorder/incivilities hypothesis assumes that these incivilities are interpreted similarly regardless of the particular situation or local context (Taylor & Gottfredson, 1986).

An encounter with disorder can either be 'direct' or 'less targeted' (Phillips & Smith, 2003). A 'direct' encounter refers to those situations whereby an individual is the direct target of an intentional act of deviance. A 'less targeted' encounter occurs when an individual observes or hears about an intentional action directed at another person or group of people (Phillips & Smith, 2003). Signs of disorder can also be encountered after the act. This is more often the case with signs of physical disorder. Hunter (1978) and Lewis and Maxfield (1980) identified disorder as being both 'social' and 'physical' in nature (Robinson, *et al*., 2003). 'Incivilities' is an all-encompassing label, which characterises these disorders (Mirrlees-Black & Allen, 1998; Ross *et al*., 1999).

[49] However, some researchers state it is not merely the presence of incivilities that triggers fear of crime, but rather a *change* in the presence of incivilities, which is accompanied by changing community satisfaction and changing perceptions of relative risk, that triggers fear of crime (Robinson *et al*., 2003; Taylor & Gottfredson, 1986).

Social incivilities encompass disorder that involves people and their behaviours (Ross & Mirowsky, 1999; Skogan, 1999). Social disorder denotes people violating social norms or official laws, or acting in an unpredictable and threatening manner (Painter, 1996: Perkins & Taylor, 1996; Ross *et al*., 1999; Skogan, 1999). Social disorder includes drug users, sex workers, beggars, gangs and people perceived to be behaving violently (Ferraro, 1995; Tulloch, 2000; Painter, 1996; Perkins & Taylor, 1996; see Ross *et al*., 1999 and Ross & Mirowsky, 1999; Skogan & Maxfield, 1981). Physical disorder refers to a neighbourhood's overall physical appearance (Ross & Mirowsky, 1999). Physical incivilities are signs of negligence and unchecked decay (Ross *et al*., 1999; Skogan, 1999). They can also be the by-products of social disorder that have not been managed or taken care of by the community. Physical incivilities are typically ongoing conditions (Skogan, 1999). Physical disorder includes abandoned buildings, graffiti, damaged property and broken streetlights (Byrne, 11/5/1999; Doeksen, 1997; Painter, 1996; Ross *et al*., 1999; Skogan, 1999). While not legally defined crimes, both social and physical signs of disorder trigger fear of crime. Likewise, so do the threatening environments discussed next.

2.2.4.2. Threatening and safe environments theories

Although similar to the disorder/incivilities hypothesis and signal crimes hypothesis, which link fear of crime with certain cues in the environment, the threatening environments[50] hypothesis does not reflect a breakdown in social control. Threatening environments instead provide an all-encompassing label for those objects and acts that generate fear of crime, but do not signify disorder. Like disorder, threatening environments can be either physical or social in nature.

Threatening physical environments are a manifestation of urban planning or lack there of. While signs of disorder are not necessarily present in threatening environments, they may generate fear because they are perceived as attractive sites for criminal victimisation. Threatening physical environments commonly have characteristics that prohibit natural surveillance. Some researchers refer to this as 'a

[50] Fear of crime literature does not formally name the threatening and safe environments theories. Threatening environments theory emerges from various other smaller hypotheses of an environment-based nature.

lack of prospect', 'blocked prospect' or 'concealment' (Fisher, 1995; Nasar *et al*., 1993). For example they may have poor street lighting and barriers that prevent 'sightliness', or visibility to others, thereby creating hiding spots for offenders (DTUPA *et al*., 2002; Painter, 1996). These barriers include the presence of alcoves, too many bushes and overgrown vegetation (Cozens, 2002; Kuo & Sullivan, 2001; Newman, 1972; Fisher, 1995). Similarly, threatening physical environments may have entrapment spots, which block the escape of victims (DTUPA *et al*., 2002; Fisher, 1995).

There is a second characteristic, independent of urban planning, that can affect whether an environment is considered threatening. The literature indicates that fear of crime is influenced by time of day (Nasar & Jones, 1997). Researchers agree that people have increased fear after dark (Brantingham & Brantingham, 1995; Doran & Lees, 2003; Fisher, 1995; Painter, 1996; Samuels & Judd, 2002). The reduction in visibility and recognition abilities, and the creation of blind spots, shadows and potential places of entrapment plays a role in the physical environment (Painter, 1996). The change in the social character of environments during the night is also likely to be an influencing factor (Koskela, 1999).

Threatening social environments may also generate fear while not representing disorder. There are two types of threatening social environments. The first type of threatening social environment is that which has an absence of pedestrian activity. A lack of natural surveillance or 'eyes on the street' induces fear (Jacobs, 1961; Samuels & Judd, 2002). This is partly based on Jacobs (1961) premise that criminals do not want to be observed, as it increases their risk of being reported and apprehended. Social surveillance increases the perceived risk of detection for offenders, prompting them to participate in criminal activity in less populated areas (Jacobs, 1961). In line with this, there is a common perception that unaccompanied individuals are more attractive targets for victimisation (Painter, 1996). A lack of social surveillance could also increase a potential victim's fear of crime for two more reasons. Firstly, there is a lack of potential witnesses who could seek help from police or other authorities (Jacobs, 1961; Samuels & Judd, 2002) and secondly, there is a lack of capable guardians who could help resist an attack (Painter, 1996). In converse, social surveillance arguably

reduces fear of crime, as can the other environmental factors discussed next (Doeksen, 1997; Loukaitou-Sideris, 1999).

Safe environments, the opposite of threatening environments, could potentially help the feel a reduced sense of fear of crime. Safe environments theoretically lack those environmental cues that trigger the public to feel afraid of crime, for example areas to hide and signs of social or physical disorder. They also contain other environmental cues that reinforce perceptions of safety. Very little information in the fear of crime literature has been gathered on such 'safe cues' or 'control signals'.

Nasar (1998) discusses cues he labels as 'likeable features', which could trigger people to feel safe. These include signs of 'naturalness' (for example vegetation and mountains), 'upkeep/civilities' (well maintained areas), 'openness' (open spaces and scenery), 'historical significance' (features with an historical feel), and 'order' (organisation and compatibility of features) (Nasar, 1998). Cozens, Hillier and Prescott (2001) additionally suggested that 'upkeep/civilities' and 'order' can decrease fear of crime. Vegetation, despite potentially being a source of fear when causing concealment and areas to hide, has also been found to reduce fear of crime in some studies (Kuo & Sullivan, 2001). Appleton (1975) also proposes that the public is more inclined to feel safe in environments that have adequate prospect (providing opportunities for surveillance) and an opportunity to achieve concealment (refuge) (Yokohari *et al*., 2004). In similar vein the signal crimes perspective, discussed next, also draws light on the presence of 'control signals' in an environment (Innes, Fielding & Langan, 2003; Millie & Herrington, 2005). Control signals are defined as "acts of social control that communicate a message to the public" (Innes, 2004). Police and town planners generally put them in place to provide reassurance to the community and they have a positive effect by reducing perceptions of criminogenic risk (Innes, Fielding & Langan, 2003; Millie & Herrington, 2005).[51]

[51] However, control signals may inadvertently have a "negative impact upon public perceptions of security" (Innes, 2004). Such control signals could include the presence of Closed-Circuit Television (CCTV) cameras, which while partly erected to reduce crime and fear of crime could simultaneously denote the presence of an unsafe area thus increasing fear of crime.

2.2.4.3. Signal crimes perspective

The signal crimes perspective, put forward by Innes and Fielding (2002), refines some of the generalisations inherent in the disorder/incivilities hypothesis. It draws on social semiotics and symbolic interactionist sociology to illustrate how the wider social character of the environment shapes the way crime and disorder are interpreted and rendered meaningful. The signal crimes perspective argues that different crimes and disorders have a disproportionate impact on how people interpret them, and the extent to which they connote criminogenic risk. It also recognises that although community members may share common values, different individuals and groups vary in the way they interpret crime and disorder (Innes, 2004; Innes & Fielding, 2002; Innes *et al*., 2002.

A brief theoretical background in semiotics and signs is necessary for the understanding of signal crimes. Semiotics theory advises that signs are objects[52] or acts that mean something to someone in a context (Innes, 2003). Social semiotics examines signs in light of how their meaning in different cultural and situational contexts will vary. Signs are composed of two components. The first component of a sign is it's 'expression', it's denotative description (Innes, 2004). The second component is it's 'content', it's connotative description. According to Eco (1976), signals are defined as signs that have an effect. The effect of a signal can be 'affective' (changing how the onlooker feels), 'cognitive' (changing how the onlooker thinks), 'behavioural' (changing how the onlooker acts), or a mixture of each (Innes, 2004). Recapping, all signals have an expression, content and effect, which in combination, act to establish meaning and differentiate signals from other signs (Innes, 2004).

The signal crimes perspective differentiates 'signal crimes' and 'signal disorders'. With regard to expression, 'signal crimes' encompass those signals that denote criminal incidents, for example a mugging (Innes, 2004). The content is that they indicate the presence of criminogenic risk. In this example it is the risk of mugging (Innes, 2004). 'Signal disorders' follow on from the disorder/incivilities hypothesis. In semiotics

[52] An object is anything that can be indicated, everything that is pointed to or referred to (Blumer, 1969).

terms, while not directly denoting a legally criminal incident, signal disorders[53] also connote criminogenic risk (Innes, 2004).

Instead of supposing all crimes and disorders generically lead to fear of crime, as with some disorder/incivilities theorists and the positivist view of crime, the signal crimes perspective focuses on how and why different signal crimes have a different effect, despite having the same content (Innes & Fielding, 2002). Innes and Fielding (2002) refer to Slovic's (1992) hypothesis that proposed different risks have different 'signal values'. The signal value refers to the extent, strong or weak, a signal crime shapes one's perception of risk (Innes & Fielding, 2002). Strong signal crimes are those acts or objects that are seriousness enough to generate a "significant degree of public awareness" (Innes & Fielding, 2002). Weak signal crimes do not generate such perceptions of criminogenic risk, when encountered in isolation. However, an accumulative impact occurs when numerous weak signals are encountered in succession or combination (either temporally or spatially). They are then interpreted as a strong signal (Innes, 2004; Innes & Fielding, 2002).

Another addition to the disorder/incivilities hypothesis is the situational relevance of signal crimes. The signal crimes perspective contends that identical objects and acts may be signal crimes in one environment and not another (Innes, 2004). The content and effect of a signal crime is highly contextualised and situational (Innes & Fielding, 2002). Therefore one's interpretation of a signal crime is sensitive to characteristics of the social and physical environment in which it is located (Innes & Fielding, 2002). Innes and Fielding (2002) use the example that graffiti in a neighbourhood with good social control might act as a signal crime because of its high 'dissonance' value, whereas it might go unnoticed in a neighbourhood with the presence of more serious crime and disorder.

The signal crimes perspective realises that the disorder/incivilities hypothesis has merit in the idea that certain signal crimes and signal disorders are common throughout a community. Innes (2004) draws on symbolic interactionist sociology to highlight the

[53] As discussed in the previous section, disorders can either be social or physical in their denotative expression.

role of social reactions in defining deviant acts (Innes, 2004).[54] Slovic (1992) reasons that people do not define risk purely on the expression of the signal crime itself, but according to its nature and one's personal context (Innes & Fielding, 2002). Risk is dependent upon surrounding belief systems, such as those governing acceptable social norms (Innes &Fielding, 2002). If community members share common social norms then signal crimes may be commonly interpreted. However, the signal crimes perspective recognises that there is not necessarily consensus between community members on which acts or objects are considered signal crimes (Innes & Fielding, 2002). Nor is it assumed that common signal crimes are interpreted in the same manner, to the same extent or have the same effect (Innes & Fielding, 2002; Innes, 2004).[55]

Signal crimes are interpreted in light of an individual's past experiences with similar objects, personal values and concerns (Innes, 2004). An assessment of the situation and prediction about the likelihood of future risks then takes place (Innes, 2004). Consequently, a particular personal reaction to the signal crime occurs (Innes & Fielding, 2002). Thus the signal crimes perspective recognises that different individuals vary in the way they interpret and render meaningful signs of disorder. Similarly, different signal crimes vary in their effect on people. As mentioned, there are a variety of cognitive, affective and behavioural reactions people can exercise after encountering a signal crime. By their definition, signal crimes always induce a cognitive and affective reaction, adversely altering criminogenic risk perceptions and causing feelings of heightened fear and anxiety (Innes & Fielding, 2002). Subsequently the effected people may also adopt a behavioural change in order to protect themselves from victimisation (Innes & Fielding, 2002).

[54] Symbolic interactionism is a label for an "approach to the study of human group life and human conduct" (Blumer, 1969). Symbolic interactionism contends the meaning of objects and things is derived from the social interaction one has with one's fellows (Blumer, 1969).
[55] This is relevant to different individuals and socio-demographic groups. For example factors such as age, gender and experience of previous victimization may shape how certain signal crimes are interpreted and rendered meaningful (Innes, 2004).

2.2.4.4. Topic review: Intuitive environmental studies into cues triggering fear of crime

The environmental theories propose that signs of disorder (also known as incivilities or signal crimes/disorders) and other stimuli in threatening environments can trigger fear of crime. While the environmental theories are well established, different components of the theories have not been fully examined. New research could specifically determine what environmental cues trigger fear of crime in different environments. These studies could, for example, pay attention to potential differences in the content, effect or signal value of different environmental cues in different situational contexts.

2.2.5. Section synopsis: An opening for pertinent environmental studies

The criminal opportunity and risk of victimisation theories state that crime is the primary cause of fear of crime. Drawing on the literature, it is agreed that while crime certainly does lead to fear of crime, there is also evidence fear of crime can occur in areas of low crime. Therefore research into the other factors associated with fear of crime is necessary. An ample amount of research has tested the demographic theories by examining the potential associations between fear of crime and victimisation, indirect-victimisation and personal feelings of vulnerability. The demographic theories are still contested. Regardless, it is unlikely further studies into these associations will provide new information or substantially progress the fear of crime research field. Similarly, numerous studies have examined the various social theories that propose fear of crime is caused by, and actually represents, risk society feelings or concern about social disorganisation. While there may be a relationship that can be explored, general feelings of uncertainty or concern cannot substitute fear of crime. Consequently fear of crime studies should use survey questions that minimise the likelihood of producing results that could represent fear of crime as something other than ‘fear’ of ‘crime’.

There is clear evidence that environmental cues, for example signs of disorder and other stimuli in threatening environments, can trigger fear of crime. Despite the fact that several studies have investigated the link between fear of crime and environmental

cues, it appears there is room for more research responding to the environmental theories. New environmental studies could not only fill gaps in the existing research, but also provide quite relevant and useful information. This is because environmental cues are considered to be widespread and account for much of the fear of crime not caused by actual crime. Thus environmental cues are a major component in making fear of crime such a social problem. The next section presents the reasons why fear of crime is considered a social problem.

2.3. Fear of crime as a social problem

Much of the fear of crime literature emphasises the idea that fear is only functional and rational when it matches the level of objective risk. Fear of crime is practical when it enables people to take heed of warning signals about real threats and therefore protect themselves from danger (Clark, 2003; Lane & Meeker, 2003; Warr, 2000). Clark (2003) states that fear of crime is a normal emotional response necessary for survival, however only when appropriate to the degree and type of threat. Warr (2000) similarly argues that while fear is not negative, it becomes problematic when exceeding the likelihood of victimisation. As discussed earlier in section 2.2.1, this often occurs and thus fear of crime has become a significant social problem in some areas (Pain, 1991). Researchers even allege that fear of crime is now a larger problem than crime itself (Bannister & Fyfe, 2001; Bennett 1990; Hale 1992; Farrall *et al*., 2000; Warr 1984). Fear of crime has its own distinct consequences that negatively affect both individuals and the community at large (Perkins & Taylor, 1996). It is these consequences that warrant the study of fear of crime.

2.3.1. Negative consequences at the individual level

Fear of crime can have various negative effects at the individual level (Perkins & Taylor, 1996). Many studies conclude that fear of crime dramatically effects people's quality of life and well-being (Bannister & Fyfe, 2001; Green *et al*., 2002; Farrall, 2000; Nasar *et al*., 1993). These effects range from detrimental physiological, psychological reactions and behavioural reactions.

In terms of physiological changes, fear of crime is associated with increased heart rate, rapid breathing, decreased salivation, and increased galvanic skin response (Thomson 1979; Warr, 2000). Endocrinic changes, such as the release of adrenaline into the bloodstream, may also occur to prepare us for a 'fight or flight' response (Skogan & Maxfield, 1981).[56] At the psychological level, fear of crime can produce negative feelings of anger, outrage, frustration, violation and helplessness (Ferraro & LaGrange, 2000; Warr, 2000). These feelings can extend to those of anxiety, distrust of others, alienation and dissatisfaction with life (Miceli *et al*., 2004). Fear of crime is also strongly correlated with mental health and sometimes triggers mental illness (Green *et al*., 2002; Miceli *et al*., 2004). This more serious psychological reaction includes acute or chronic psychological states of depression, trauma (Ferraro & LaGrange, 2000; Spelman, 2004).

Alongside these wide ranging physiological and psychological effects, fear of crime can prompt people to change their behaviour. Behavioural adaptations include the adoption of protective devices, which will be discussed in section 2.4.1.4.a. However, of primary relevance are the constraints people place on their lives, particularly through the avoidance areas where they do not feel safe (Cornell, 13/7/2002; Doran & Lees, 2003; Doeksen, 1997; Nasar *et al*., 1993; Painter, 1996). This avoidance reaction means that fear of crime is often seen to have a substantial affect on the autonomy of certain social groups, especially women and the elderly.[57] It is therefore essential the avoidance reaction is researched and addressed. Evidence from an Adelaide based study supports this statement, showing that fear of crime is increasingly becoming an important issue for Australians and their quality of life (DTUPA *et al*., 2002). The former NSW Police Commissioner, Ken Moroney, has even formally stated that fear of crime "is as debilitating as the crime itself" (Cameron, 7/2/2002). However, fear of crime can have numerous other impacts at the community level. These impacts prompted the former Commissioner's statement and subsequent attention from the police.

---

[56] Additonally, according to Koveces (1990), fear is more generally associated with: physical agitation; increased heart rate; lapses in heart beat; blood leaves face; skin shrinks; hair straightens out; drop in body temperature; inability to move, breathe or speak; involuntary releases of bowels or bladder; sweating; nervousness in the stomach; and dryness in the mouth.

[57] There is a common idea that older people are prisoners of fear (Joseph, 1997; Pain, 2000; Stephens, 1999).

2.3.2. Negative consequences at the community level

The most ominous hypothesis regarding the consequences of fear of crime is that it causes a spiral of decline that can ultimately lead to the physical, social[58] and economic[59] decay of affected neighbourhoods (Bannister & Fyfe, 2001; Nelson *et al*., 2001; Skogan, 1990; Taylor, 1986). Some researchers even state that fear of crime can have a direct impact upon actual crime rates.[60] Jeffery (1971) was one of the first researchers to come to this conclusion. Following on, Wilson and Kelling (1982) and Skogan (1986, 1990) are widely known for their 'broken windows' and 'disorder and decline' theories on the subject.

2.3.2.1. Broken windows hypothesis

In their widely quoted[61] paper titled 'Broken Windows', Wilson and Kelling propose a negative feedback loop whereby unchecked incivilities and disorder not only lead to fear of crime, but also crime itself. Using the broken window as a symbol for all types of disorder, their account of this causal relationship is now commonly referred to as the broken windows hypothesis (Doran &Lees, 2003).

---

[58] It is commonly accepted that fear of crime is a major social problem (Liska *et al*., 1988). Studies have confirmed that fear of crime disrupts neighbourhood cohesion (Nasar *et al*., 1993); fractures the sense of community and neighbourhood (Box *et al*., 1988; Ross, 1999); creates interpersonal distrust (Garofalo, 1981); breaks down social relations and attachment (Greenberg *et al*., 1982; Spelman, 2004); leads to social isolation (Doeksen, 1997; Ross, 1999); adds to an erosion of social control and social order (Ross & Mirowsky, 1999); is damaging to the public image of a community and causes avoidance behaviour in potential visitors (Doeksen, 1997; Nasar *et al*., 1993; Skogan, 1990; Warr, 2000); and causes a removal of 'eyes on the street' and informal natural surveillance (Jacobs, 1961; Painter, 1996; Samuels, 2002).

[59] Fear of crime has a negative effect on the economy by discouraging homebuyers and causing emigration of residents (Gibbons, 2004; Oc & Tiesdell, 1997; Katzman, 1980 in Smith, 1997); causing retail businesses to suffer a shortage of customers and consequently closing down (Garofalo, 1981; Oc & Tiesdell, 1997; Warr, 2000); suppressing investment and causing relocation of business (Garofalo, 1981; Taub *et al*, 1984; Spelman, 2004); forcing the police to invest more time and financial costs into affected communities (Murray *et al*., 2001), and governments and councils to compensate for the upkeep of affected areas and the management of disorder.

[60] Some researchers conclude that fear of crime creates an environment where crime is likely (Millie & Herrington, 2005). The absence of natural surveillance and the potential for, or real deterioration of the neighborhood's social fabric, increases the attractiveness of the area for opportunities of crime (Harcourt, 1998; McLaren, 1992; Painter, 1996). This is because criminals do not generally want to be observed or reported (DTUPA, 2002).

[61] For additional information and interpretations see Doran & Lees, 2003; Gibbons, 2004; Greene, 1999; Harcourt, 1998; Millie & Herrington, 2005.

The key underlying theme in broken windows hypothesis is based on the presumed likelihood that if a window is broken and left unrepaired (or disorder is left unchecked) then more windows will be broken (more disorder will occur) (Wilson & Kelling, 1982). Wilson and Kelling draw on the incivilities/disorder hypothesis, testifying that an unrepaired broken window (untended disorderly behaviour) becomes a signal that no one cares and leads to a breakdown in community controls. Thus with the opinion that they will not be reprimanded, people will participate in more disorderly behaviour (Wilson & Kelling, 1982). According to the theory, passersby perceive these areas as uncontrolled and will accordingly avoid them (Wilson & Kelling, 1982). Criminals, both opportunistic and professional, believe they have reduced chances of being caught or identified and will consequently invade the area (Wilson & Kelling, 1982). Therefore there is an influx of real crime and a negative feedback loop between disorder, fear of crime and crime escalates (see Figure 1).[62]

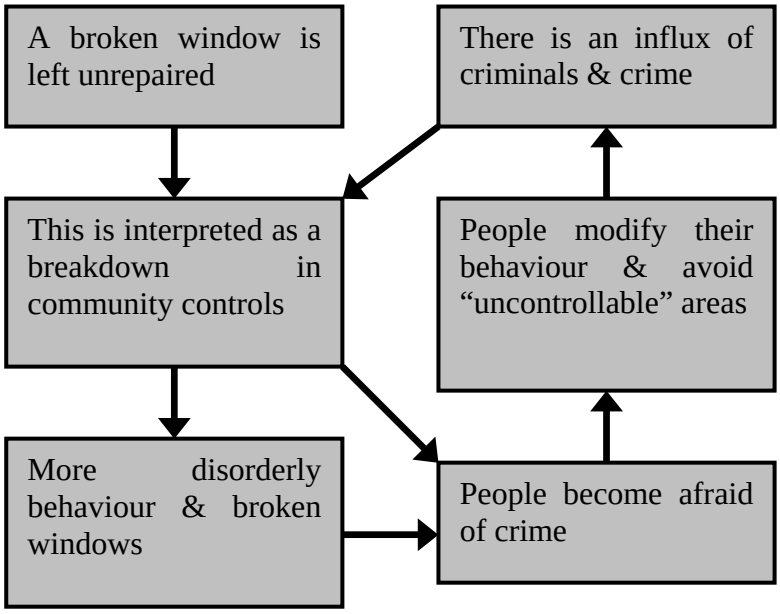


Figure 1. Flow chart illustrating the broken windows hypothesis.

[62] Wilson and Kelling (1982) provide a colourful description of the processes of decline following a breakdown in community controls: "*A piece of property is abandoned, weeds grow up, a window smashed. Adults stop scolding rowdy children; the children, emboldened, become more rowdy. Families move out, unattached adults move in. Teenagers gathering from of the corner store. The merchant asks them to move; they refuse. Fights occur. It accumulates. People start drinking in front of the grocery; in time, an inebriate slumps to the sidewalk and is about to sleep off. Pedestrians are approached by panhandlers. At this point it is not inevitable that serious crime especially violent attacks on strangers will occur. But many residents will think that crime, especially violent crime, is on the rise, and they will modify their behaviour accordingly. They will use the streets less often, and when on the streets will stay apart from their fellows, moving with averted eyes, silent lips, and hurried steps*" (Wilson & Kelling, 1982).

There are numerous competing accounts regarding the reputability of the broken windows hypothesis. Many researchers and practitioners readily accept the theory. It has therefore had considerable influence on research, policy and practice (see Doran & Lees, 2003; Harcourt, 1998; Stephens, 1999; Xu *et al*., 2005). However, just as many critics discount the fundamental presumptions of the broken windows hypothesis (see Harcourt, 1998; Bowling, 1999; Greene, 1999; Taylor, 2001). Innes (2004) contends that there is a serious lack of empirical evidence supporting the thesis. Harcourt (1998) criticises broken windows hypothesis and those policing strategies based upon it, highlighting the fact that they neglect numerous other complex factors that also contribute to crime. The proposition that people respond equally to both 'broken windows' and 'broken people' has also been challenged (Innes, 2004). Additional criticisms of the broken windows hypothesis are given following the next section on disorder and decline hypothesis.

2.3.2.2. Disorder and decline hypothesis

Skogan's (1986, 1990) disorder and decline hypothesis expands upon the broken windows hypothesis (see Figure 2). Like the broken windows hypothesis, the disorder and decline hypothesis begins with the justification that people gather information about the level of crime and safety in their neighbourhood through environmental cues (Skogan & Maxfield, 1981). Skogan (1990) maintains that signs of disorder are associated with high levels of risk and imply neighbourhood systems of social control have broken down.[63] When people encounter signs of disorder they physically withdraw from those areas, confining their activities to those times and routes perceived as the safest. This reduces the amount of informal social surveillance that occurs naturally with pedestrian activity (Skogan & Maxfield, 1981; Skogan, 1986). However unlike Wilson and Kelling, Skogan elaborates on the added psychological withdrawal of residents from the streets (Skogan, 1986). Skogan and Maxfield (1981) report that crime and disorder, through fear of crime, generate suspicion and distrust. This has an atomising effect upon individuals and households (Skogan & Maxfield, 1981).[64]

[63] Skogan (1990) specifically defines disorder as "direct, behavioral evidence of disorganization".

[64] Crime and disorder undermine people's trust that their neighbours share common goals and norms (Skogan & Maxfield, 1981). This can lead to hostility and antipathy (Skogan, 1990). Disorder reduces resident confidence that their individual and collective actions can overcome disorder, (Skogan & Maxfield, 1981; Skogan, 1990).

Skogan then argues that disorder restricts the neighbourhood potential for organisational life and mobilisation (Skogan, 1986).

In addition, Skogan (1986) proposes that perceptions of disorder could cause a decrease in the geographic area that people feel responsible for. This in turn weakens community mechanisms of informal social control and surveillance.[65] With a decrease in social control and a community's mobilisation capacity to combat disorder, Skogan mirrors Wilson and Kelling's argument in stating the neighbourhood will invite 'outside troublemakers' who bring additional crime and disorder (Skogan, 1986). Skogan also elaborates on the economic impact of disorder on affected neighbourhoods. The first point he makes is in relation to a deterioration of local business conditions (Skogan, 1986). With fewer people on the streets, there will be fewer business customers, shops being forced to close down (Skogan, 1986). These empty shops are likely to remain abandoned or be converted to non-retail establishments (Skogan, 1986). Economic forces favour those traditionally 'unsavoury' businesses, such as bars, transient hotels, x-rated outlets and massage parlours (Skogan, 1986). Skogan continues that these businesses, and the 'unsavoury' people they attract, will further decrease the desirability of the area for people with a low tolerance for disorder (Skogan, 1986).

Skogan's second presumption is that, with an increasingly bad reputation, the local housing market becomes unstable (Skogan, 1990). Residents who are able to move to other areas, and fewer people want to move into or invest in the area (Skogan, 1990). Skogan states that this leads to a downward turn in the real estate market of affected areas and cause the further deterioration and abandonment of buildings (Skogan, 1990).[66] At this point, the disorder and decline hypothesis implies that disorder and these consequent social and economic problems continue to "feed on themselves, spiralling neighbourhoods deeper into decline" (Skogan, 1986). Feedback processes

[65] Skogan explains this using the concept of 'territoriality', which is a "set of attitudes and behaviours regarding the regulation of the boundary that surrounds people's personal household space" (Skogan, 1986). He claims that with healthy levels of territoriality residents will conduct surveillance over a wide area (Skogan, 1986). Surveillance is facilitated by personal recognition of one's neighbours and a belief that local standards of appropriate public behaviour are widely shared (Skogan, 1990). These factors become diminished, thereby negating the underlying necessities for social surveillance and the psychological defence of public space.

[66] Nevertheless, Skogan does recognise other factors play an important role in determining demand for property (Skogan, 1986).

ensure fear of crime increases until it is "incapacitating" (Skogan & Maxfield, 1981; Skogan, 1986).[67]

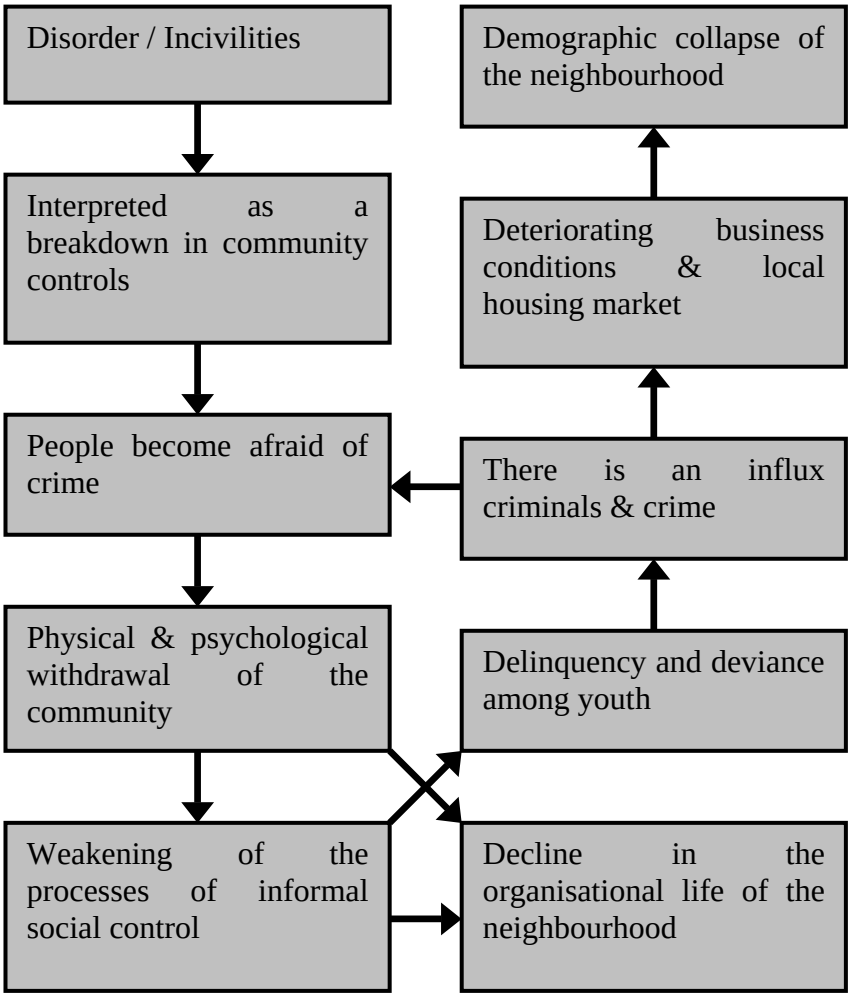


Figure 2. Flow chart illustrating the disorder and decline hypothesis.

Skogan (1990) cemented his disorder and decline hypothesis with empirical research. A few researchers support his findings. They agree that there is a direct link between disorder and crime.[68] In contrast, Markowitz, Bellair, Liska and Liu (2001) point out that studies supporting the broken windows and disorder and decline theories are largely based on cross-sectional data. As the theory is longitudinal in nature more

[67] The end of this cycle is characterised by a demographic collapse of the neighbourhood, when crime and disorder continue but there are few residents left to define it as a problem (Skogan, 1986). Schuerman and Kobrin (1986) argue that those areas characterised by at least three decades of high crime are "lost territory to the rest of society" (in Skogan, 1986).

[68] These include Kelling and Coles (1997) who state that Skogan's research also supports the broken windows hypothesis. Similarly in their own study, Ross and Mirowsky (1999) declare disorder and decay are highly correlated with crime and share many indicators.

evidence is necessary to confirm the causal effect of disorder.[69] Harcourt (1998) also found that Skogan's data did not support the claim that crime is related to disorder.[70]

2.3.2.3. Topic review: Potential problems not to be ignored

Regardless of the differences between broken windows hypothesis and the disorder and decline hypothesis, they both concur that fear of crime can have some serious consequences for individuals and the community. The signal crimes perspective also appreciates that fear of crime can reduce social cohesion and collective efficacy by undermining mutual trust. Although this is a grave social problem, the signal crimes perspective endorses that there is also the potential that crime and disorder generate positive collective action within a neighborhood (Innes & Fielding, 2002). These positive collective actions are discussed in the next section.

2.3.3. Combating fear of crime

Koskela and Pain (2000) contend that one of the fundamental components of criminology is its role of providing useful information for crime prevention policy (Cozens *et al*., 2001). Crime prevention policies and procedures are those designed to reduce actual and perceived levels of crime (Wagner, 1997). While Stanko (2000) reports crime and fear reduction is the responsibility of individuals, this section covers only those collective crime prevention initiatives. A collective response to crime involves any "activity in which unrelated individuals act jointly to do something about crime" (Dubow *et al*., 1979). Combating fear of crime is discussed under the headings 'policing crime and fear of crime', 'community involvement in crime prevention' and 'fear of crime prevention through government policy and planning'.

[69] However, Markowitz, Bellair, Liska and Liu (2001) do admit that disorder may increase crime indirectly through its effect in increasing fear of crime and decreasing social involvement and collective efficacy. Similarly, Sampson and Raudenbusch (1999) emphasise that it is not the disorder that causes the crime, but rather poor social control that causes both.

[70] While Harcourt confirmed that certain crimes like physical assault and robbery are at first significantly related to disorder, Harcourt argues that this relationship disappears when the variables of neighbourhood poverty, stability and race are held constant.

2.3.3.1. Policing crime and fear of crime

Fear of crime and other non-criminal community problems are not typically considered in conventional policing models. Instead, policing is traditionally[71] reactive and crime-incident oriented, requiring an offence before police act (Xu *et al*., 2005). Even so, the police often deal with disorder and fear of crime more than actual crime (Glensor & Peak, 1996). Hence policing models are increasingly focusing on a more in-depth understanding of non-criminal problems, like fear of crime (Ashby & Longley, 2005). Fear of crime therefore features in 'problem oriented policing', 'zero tolerance' or 'disorder policing', and 'community oriented policing' models. Despite their limitations, proactive and crime prevention components of these popular models help to fight crime and fear of crime (Xu *et al*., 2005).

Problem orientated policing was developed by Goldstein (1979) and employed in the early 1980s by policing practitioners like Kelling (1982), the initiator of the broken windows hypothesis (Sims *et al*., 2002). Under this model the police aim to pro-actively prevent crime, rather than react to incidents. The police deal with non-criminal problems that concern or cause harm to the community, for example disorder and fear of crime (CPOP, 2003; Sims *et al*., 2002). The police identify public concerns and carry out thoroughly planned responses to those concerns (CPOP, 2003; Lawton *et al*., 2005).[72] Problem oriented policing incorporates a framework for situational crime prevention when acting on identified problems. Situational crime prevention makes use of the criminal opportunity and risk of victimisation theories by aiming to increase the risks to potential offenders and reduce the rewards or benefits from criminal activity (CPOP, 2003). Therefore unlike standard policing models, problem oriented policing is geographically focused and allows localised intervention (Lawton *et al*., 2005).

Zero tolerance policing, also known as order-maintenance policing or disorder policing, is widely discussed in the fear of crime literature (Harcourt, 1998). Zero

[71] Standard models of policing also apply generic strategies aimed at crime reduction across multiple jurisdictions. This is done regardless of the level and nature of crime within each different jurisdiction (Weisburd & Eck, 2004).

[72] This process is based on the SARA model (Scanning, Analysis, Response and Assessment) and often involves other public agencies and the private sector, with the community being identified as potentially important policing partner in dealing with problems like fear of crime (Sims *et al*., 2002; CPOP, 2003).

tolerance policing strategies respond to Wilson and Kelling's (1982) broken windows hypothesis and Skogan's (1990) disorder and decline hypotheses with the assumption that police intervention in reducing disorder can reverse those processes of neighbourhood decay and criminal activity (Crank *et al*., 2003; Katz *et al*., 2003). The apparent success of the New York Police Department's zero tolerance program of the 1990s is a frequently cited as a successful example of this, however some critiques suggest the decline in New York's crime levels were the result of other factors (see Kelling & Coles, 1997; Harcourt, 1998; Greene, 1999; Katz *et al*., 2003). While grounded in problem oriented policing, zero-tolerance policing does not focus on police-community interaction like community oriented policing.

Stemming from problem oriented policing, community oriented policing specifically promotes "community police partnerships, proactive problem-solving, and community engagement to address the causes of crime, fear of crime, and other community issues" (Dietz, 1997). A police understanding of, and response to, public perceptions of crime and disorder is fostered (Baker & Wolfer, 2003; Dietz, 1997; Sims *et al*., 2002).[73] Police empower and work with city agencies, businesses, service providers and the community at large to identify, prioritise and resolve citizen concerns (Adams *et al*., 2005; Glensor & Peak, 1996; Sims *et al*., 2002). Such communication can take the form of neighbourhood meetings, local crime newsletters and the organization of neighbourhood watch programs (Baker & Wolfer, 2003). Another aim of community oriented policing is that if police and community appear to work cohesively then potential criminals could be deterred from behaving anti-socially (Baker & Wolfer, 2003).[74] Public cooperation with police, and increased police visibility reduces public fear of crime (Adams *et al*., 2005; Dietz, 1997; Salmi *et al*., 2004).[75] It is argued that such inter-agency approaches to reducing crime and fear of crime are

[73] However despite this benefit, community oriented policing is criticised as being a spatially generalist model that does not reflect local conditions (Bennett, 1991; Spelman, 2004).
[74] Reassurance policing emphasises this notion even further by focusing on police visibility, familiarity and accessibility in an effort to thwart declining public confidence in the police (Povey, 2001 in Millie & Herrington, 2005). Reassurance policing places a strong emphasis on the reduction of disorder and fear of crime by focusing scarce police resources on the root causes of these issues (Millie & Herrington, 2005).
[75] For example in terms of avoidance, Skogan and Hartnett (1997) found that residents in jurisdictions governed by community oriented policing avoided fewer areas due to worrying about victimisation than residents in non-COP neighbourhoods (Sims *et al*., 2002). Then again, Weisburd and Eck (2004) found that community oriented policing only reduced fear of crime when implemented with models of problem oriented policing (Weisburd & Eck, 2004).

most successful. Thus community involvement in crime prevention, discussed next, is favourable.

2.3.3.2. Community involvement in crime prevention

Combating fear of crime should involve police, community and government partnerships that are inclusive of all interested parties (Walklate, 2000). Many community based crime initiatives do provide a community-police partnership. Surveillance activities like neighbourhood watch programs are most common, whereby residents report any suspicious activity to the police. Such programs are identified as helping reduce public fear of crime (Skogan & Maxfield, 1981; Tulloch *et al*., 1998b). More intensive programs include mobile citizen patrols, whereby community groups patrol the neighbourhood with the aim of interrupting criminal activities, apprehending offenders and making citizens arrests on behalf of the police (Kenney, 1987; Skogan & Maxfield, 1981).[76] The dissemination of crime prevention information through newsletters and public meetings, which often involve the police, are also conventional (Kenney, 1987). Garofalo (1981) proposed that information about crime decreases fear of crime. According to this model, increased knowledge of local crime leads to an alteration of risk assessment, which then changes fear of crime levels.[77]

Skogan and Maxfield (1981) state that such community-based initiatives to reducing and preventing crime play a large role in independently helping to reduce fear of crime. For example, involvement in crime reduction initiatives potentially decreases fear of crime by reversing feelings of vulnerability, community concern and perceptions of social disorganisation. Skogan (1986, 1990) further suggests that participation also generates feelings of helpfulness, responsibility, territoriality and optimism, which may also reduce fear.[78] Given this, the presence of disorder and crime may actually increase

[76] On the notion of citizen patrols and private policing, 'gated' communities are also becoming popular (Rose, 2000). In the public-space communities, collective action has taken the form of site security assessments and recommendations (Kenney, 1987).
[77] However, when testing this model, Kuttschreuter and Wiegman (1998) found that a multimedia campaign reporting residential burglary and violence on the streets had no effect on fear of crime. Similarly, Hale (1983) suggests increased knowledge about crime can cause residents to become more fearful, being aware of their vulnerability to crime (in Dietz, 1997).
[78] Furthermore, Smith proposes that community participation in neighbourhood affairs helps to exert "local control over local environments", thereby reducing crime and fear (Smith, 1987). This has also been hypothesised to lead to an enhancement of feelings of interpersonal trust.

the wellbeing of a neighbourhood by encouraging preventative action and collective efficacy (Innes & Fielding, 2002). Nevertheless, government policies and plans should also assist community-based groups in attempting to combat fear of crime, as discussed next.

2.3.3.3. Fear of crime prevention through government policy and planning

Dammert and Malone (2003) propose that fear of crime should be addressed via government policies with plans aimed at lessening public economic, social and political insecurities (Dammert & Malone, 2003). These policies are largely based on the local social infrastructure in a community. They include programs addressing social problems like poverty and unemployment (Dammert & Malone, 2003; Tulloch *et al*., 1998b). Respondents in an Australian research sample also indicate that social infrastructure aimed at strengthening families and values, better rehabilitation of criminals, anti-drug education campaigns and counselling programs decrease their fear of crime (Tulloch *et al*., 1998b). These respondents also identify that changing government laws regarding harsher penalties for criminals, gun licensing and drug reform, including the legalising of heroin, further help reduce their fear of crime (Tulloch *et al*., 1998b).

In Australia, fear of crime is a secondary objective in many crime prevention and policing programs (Tulloch *et al*., 1998a). These programs are primarily the responsibility of federal and state, rather than local, governments (Tulloch *et al*., 1998b). For example the National Campaign Against Violence and Crime is an initiative of the federal government (Tulloch *et al*., 1998b). More specific government programs that inadvertently reduce crime and fear of crime include those aimed at properly socialising youths and channelling their energies into productive, or at least harmless, activities (Skogan & Maxfield, 1981).[79] While aiming to make people feel safer by reducing crime or signs of crime, many other Australian programs are

---

However, Dammert and Malone (2003) indicate "public participation in any civil society organization has no significant effect on fear of crime".

[79] Members of the Australian public also identify improving youth related programs would reduce their fear of crime (Tulloch *et al*., 1998b). Youth targeted programs consist of those operated by Police Citizens Youth Clubs (PCYCs). PCYCs promote greater discipline, better education for the disadvantaged, better recreational facilities, and more youth workers (Tulloch *et al*., 1998b).

unsuccessful in achieving this.[80] This poor result is likely because fear of crime is not specifically addressed (Tulloch *et al*., 1998a). While most of these strategies focus on social aspects of fear of crime, some also include notions of urban renewal (Tulloch *et al*., 1998b).[81] Strategies encompassing urban renewal are linked to the principles of Crime Prevention Through Environmental Design (CPTED), discussed next, which are strongly related to the disorder/incivilities hypothesis and the signal crimes perspective.

2.3.3.3.a. Crime Prevention Through Environmental Design

Strategies of CPTED are "based on the theory that proper design and effective use of the built environment can reduce the incidence and fear of crime and make an improvement in the quality of life" (Crowe, 1991). The primary goal of CPTED is to modify the physical environment so that it deters criminal activity, thereby making it safer for pedestrian activity, thus reducing fear of crime (JHSA, 1999).[82] Equally important is the aim of encouraging people to use previously avoided public spaces (Oc & Tiesdel, 1997). These aims reflect the fundamental assumption in CPTED, that environmental characteristics can be manipulated to effect human social behaviour, which subsequently reduces both the incidence of and the fear of crime (Crowe, 1991; Oc & Tiesdell, 1997; Steventon, 1996).

While Jacobs[83] (1961) is acknowledged as a forerunner in CPTED, Jeffrey (1971) is seen to have initiated CPTED in his book. Jeffrey argues that urban design can play a

---

[80] Some of those programs are evaluated by Tulloch *et al*. (1998b) as being useful fear reduction strategies, at least in conjunction with other initiatives. They include 'Combating crime and the fear of crime among older people SA', 'Glenorchy City Council Street Youth Work Project TAS', 'Reducing violence, crime and fear in Gay and Lesbian Communities NSW', 'Safer Cities and Shires VIC' and 'Residents in Safer Environments NSW'.

[81] The NSW Department of Housing worked to upgrade the targeted housing estates. Community surveillance is increased by closing alleyways, widening private space around homes and redesigning homes to face outwards toward the public setting (Capobianco, 2006).

[82] The arrangement of urban form and activity, later dubbed CPTED, was identified by Pollack (1980) as one of three environmental modification approaches to crime control. The other two approaches are the management of the environment (for example through police activity) and the use of protective devices (for example locks).

[83] Jacobs proposed that feelings of safety in inner city areas are dependent on those areas being in continuous public use. Jacobs identified three main qualities of a safe city, territoriality; surveillance and social controls (Jacobs, 1961; Oc & Tiesdell, 1997). To promote these there must be a clear demonstration between public and private space, buildings must be oriented to promote surveillance, and a diversity of street activities present to promote use and vitality (Jacobs, 1961; Oc & Tiesdell, 1997; Taylor & Gottfredson, 1986).

role in crime prevention when security is considered in street and building plans (Jeffery, 1971). Despite Jacobs' and Jeffrey's seminal works, modern CPTED strategies are based predominantly on Newman's (1972) concept of 'defensible space' (Cozens *et al*., 2001). Newman (1972) draws on Jacob's insights to devise his theory of defensible space. This hypothesis also proposes that altering the physical environment reduces opportunities for crime in urban areas (Newman, 1972; Newman, 1976).[84] Defensible spaces primarily communicate residential control, have high prospects for natural surveillance and are difficult to escape from (Oc & Tiesdell, 1997; Schweitzer *et al*., 1999). Newman's model CPTED therefore involves residents promoting surveillance opportunities, defining territorial boundaries, limiting access, eliminating conflicting uses, providing amenities, and improving area aesthetics (Oc & Tiesdell, 1997; Pollack, 1980). Brantingham and Brantingham (1993) continued by commenting that city planners can shape nodes, edges and paths in environments to affect broad patterns of crime through CPTED techniques.

Since these major CPTED theories, many researchers have devised clear procedures for CPTED planners (see for example Crowe, 1991).[85] These approaches are integrated into policy in different nations. For example the British Crime and Disorder Act 1998 requires all local authorities to take crime and disorder into account in all aspects of decision-making (Cozens *et al*., 2001).[86] However, while there are

[84] After studying crime in public housing, Newman observed that crime was discouraged from "zones of territorial influence" and that residents maintained surveillance over and defended (Newman, 1972; Pollack, 1980). Newman termed these areas defensible spaces, which he defined as a "range of mechanisms - real and symbolic barriers, strongly defined areas of influence, and improved opportunities for surveillance - that combine to bring an environment under the control of its residents" (Newman, 1972).

[85] For example, access controls are designed to keep unauthorised persons out of particular spaces. Such controls include doors, shrubs, fences and even lit porch lights (DTUPA *et al*., 2002; Wagner, 1997). Similarly, physical barriers are also used to create clear boundaries between public and private areas. These generally signify ownership and include fences, hedges, pavement treatments, art, signs, good maintenance and landscaping (DTUPA *et al*., 2002; Schweitzer *et al*., 1999). Signs of increased surveillance are also popular in CPTED projects. These include the presence of neighbourhood watch signs and even porches and mailboxes, which increase opportunities for surveillance (Oc & Tiesdell, 1997; Schweitzer *et al*., 1999).

[86] In response, the British Department of Environments Secured by Design scheme provides an accolade for housing schemes that meet specific CPTED design criteria (Kitchen, 2002). The criteria incorporate key principles such as aiming to create defensible space, territoriality and natural surveillance while minimising escape routes, crime generators and fear generators (Kitchen, 2002). Another British approach, New Urbanism, draws on Jacobs (1961) works. New urbanism recognises the importance of promoting human activity in the environment in order to achieve safety (Kitchen, 2002). A major feature is the encouragement of natural surveillance (Kitchen, 2002).

instances where the modification of the environment has not helped to reduce crime or fear of crime, many projects celebrate the successes of CPTED (Pain, 2000).

2.3.3.4. Topic review: Police, community and government cooperation

Fear of crime can be combated though a diverse range of approaches adopted by police, communities and governments. While traditional policing models have failed to acknowledge fear of crime, many models now see fear of crime as fundamental to proactive policing and crime prevention. Nevertheless, in regards to fear of crime, these models are limited by poor knowledge, their generalised responses or their lack of community involvement. Community involvement in fear reduction strategies can help reduce the fear of crime experienced by public participants. In addition, governments can potentially reduce fear of crime through policies and plans that improve social-infrastructure and the design of the environment.

2.3.4. Section synopsis: Research should provide useful information for fear of crime prevention through policy, planning and practice

Fear of crime can have severe negative impacts on both individuals and the community. It is argued that fear of crime should therefore be addressed and, where appropriate, direct measures adopted to combat these potential negative consequences. Drawing on the literature, it is acknowledged that combating fear of crime will be most successful with an interagency approach between police, government and community. Police should incorporate fear of crime into situational crime prevention practices. Likewise, government should look at fear of crime, particularly from a CPTED approach, in policy and planing. Police and government should heed community input when doing so.

Such community input can be gained though fear of crime surveys, and any corresponding research. Fear of crime studies therefore need to be designed so their results can provide useful information for police and government policy, planning and practice. In order to carry out such successful community surveys and fear of crime

studies, researchers need to be able to validly measure fear of crime. The approaches to measuring fear of crime are discussed in the next part of this chapter.

2.4. Contrasting methodologies for investigating fear of crime

Surveys or interviews enable researchers to gain the personal information necessary for the analysis of fear of crime (Skogan & Klecka, 1977). However, if fear of crime research is to provide useful information for policy and planning then the design of survey questions must be based on sound methodology. From a methodological and research design standpoint, this section reviews how fear of crime is investigated throughout the literature. This section begins with a synopsis of the lack of methodological consistency that dominates the field. Continuing, in more detail, is a review of the various approaches used to measure fear of crime and how each approach can change the operational definition of fear of crime.[87] A brief foreword to the measurement of emotions in the psychological disciplines precedes a discussion of the three major approaches used by criminologists studying the fear of crime, the cognitive, affective and behavioural measures. This section subsequently reviews how fear of crime data is traditionally analysed via statistical means. Last, it presents a brief history of the spatial analysis of fear of crime, through mapping.

2.4.1. Controversy over measuring fear of crime

In order to scientifically investigate fear of crime, the variables in question must be accurately measured (Ferraro & LaGrange, 2000). Researchers consistently dispute the method by which fear of crime should be measured. Thus there are significant contradictions in research findings, even when examining a single dataset (Burgess, 2004; Rountree & Land, 1996; Stafford & Galle, 1984; Mesch, 2000). The extent of these measurement inconsistencies seriously impedes the ability of researchers to make useful generalisations which could be used in design plans aimed at combating fear of crime (Ferraro & LaGrange, 2000). Fear of crime research is subject to four major

[87] This draws upon section 1.2.1, which discussed the various conceptualisations of fear of crime.

measurement approaches. The first approach discussed here, employed by psychologists, is not particularly widespread. The cognitive, affective and behavioural approaches adopted by criminologists are common, and are discussed later in detail.

2.4.1.1. A psychologist's approach to measuring emotion

A psychologist's approach to measuring emotion is time consuming, expensive and not conducive to a large sample size. When studying emotion many psychologists employ a psychophysiological approach, which involves monitoring people's physiological reactions when they experience different emotions (Carlson & Hatfield, 1992; Kovecses, 1990).[88] Similarly, psychologists can also employ a neurophysical approach to measuring emotion.[89] Behavioural psychologists assess people's body actions in response to different emotions. Behavioural measures for measuring emotions include assessing facial expressions, general reactivity or vocalisations (Carlson & Hatfield, 1992).[90] Other psychologists have measured emotion using adjective checklists and subjective (self-report) measures (Carlson & Hatfield, 1992). These require respondents to indicate on a scale, such as the Likert Scale, their level of emotion (Carlson & Hatfield, 1992). It is these measures of emotion that are most comparable with those used by criminologists examining fear of crime. The first of the criminologists approaches is the cognitive approach, which is discussed next.

2.4.1.2. Problems with cognitive approaches to measuring fear of crime

The research utility of traditional cognitive approaches to measuring fear of crime is highly criticised (Rountree & Land, 1996). Despite this, they are continually used in

[88] Psychologists assert emotions are revealed by the body in a continuous stream of biological electrical signals, known as biopotentials (Carlson & Hatfield, 1992). In line with the psychophysiological approach, numerous devices have been devised to assess minute changes in people's autonomic nervous system (Carlson & Hatfield, 1992).
[89] In this case, additional specialised devices are used to examine changes in people's central nervous system, peripheral nervous system, and neurocrines (Carlson & Hatfield, 1992).
[90] For example the following measures allow psychologists to examine emotion, including fear: blood volume; blood pressure; skin responses; facial responses; heart rate; pulse pressure; eye movements; and respiration rate, amongst many more (Carlson & Hatfield, 1992).

Australian[91] and international crime and safety surveys. Cognitive approaches include global and value or concern-based measures.

2.4.1.2.a. Global measures

The most widespread approach to measuring fear of crime is based on perceptions of risk. Survey respondents are typically asked to assess how safe their neighborhood is or how likely they are to be victimised (Rountree & Land, 1996). The most popular question is "How safe do you feel, or would you feel, out alone in your neighbourhood at night"[92] or something similar[93] (Ditton, 2000; Pantazis, 2000). Respondents answer by choosing from a list of options such as I feel 'very safe', 'reasonably safe', or 'somewhat safe' (ABS, 2006b; Liska *et al*., 1988; Pantazis, 2000). As these questions do not refer to a particular crime, they are often referred to as global measures (Pantazis, 2000).

There are a number of problems associated with global measures. Firstly, they are a cognitive approach, targeting what respondents think (Ferraro & LaGrange, 1988). By asking respondents "How safe do you feel…", global measures confuse fear of crime with perceived risk, invoking a general assessment of safety in one's neighbourhood (LaGrange & Ferraro, 1987). Ferraro and LaGrange state that while perceived risk may be an important predictor of actual fear, (Rountree & Land, 1996), peoples perceptions of risk of victimisation are "vastly different" from their feelings of fear of victimization (Ferraro & LaGrange, 2000). Thus, perceived risk is distinct from, and cannot be used to measure, people's fear of crime (Pantazis, 2000; Rountree & Land, 1996).

Furthermore, it is uncertain whether respondents' answers to global measurement questions actually reflect their perceptions of risk in the area, knowledge of real risks of

---

[91] For example, the ABS' General Social Survey of 2006 asked respondents "How safe or unsafe do you feel walking alone in your local area after dark?" (ABS, 2006b).

[92] These survey questions gained prominence through the Gallup Organisation (American Institute of public opinion research) from 1965, the 1978 National Opinion Research Centre and in the Brtish Crime Surveys of 1984, 1988, 1992 and 1994 (Mayhew, 1995; Skogan & Maxfield, 1981).

[93] Variations of this question include: "How safe do you feel in certain areas?"; "How safe do you feel when walking alone?" (Ditton, 2000); "How safe do you feel when walking in this area after dark or when you are alone in your own home at night?" (Pantazis, 2000).

victimisation or genuine emotional fear (Garofalo & Laub, 1979; Pantazis, 2000; Rountree & Land, 1996; Wilson &Kelling, 1982). Due to this ambiguity inherent in the respondents' answers, such global measures are criticised as being vague and problematic (Rountree & Land, 1996). A similar global question asks "is there any area right around here - that is, within a mile – where you would be afraid to walk alone at night?" (LaGrange & Ferraro, 1987). This question is more likely to tap into the emotional aspect of fear because the word 'afraid' is used, however it is still ambiguous and seems excessively foreboding (LaGrange & Ferraro, 1987).

The word 'crime', or a specific act or acts that constitute crime, is not mentioned in global measurement questions (LaGrange & Ferraro, 1987). Respondents may not be sure what they are meant to feel safe or unsafe from, and therefore could confuse their fear of crime with fear in general (Garofalo, 1979; LaGrange & Ferraro, 1987). This creates a conceptual issue for people with specific phobias that cause them to feel unsafe in certain areas. It also opens the door to the various social theories that argue, for example, that people's fear of crime actually reflects their perceptions of sub-cultural diversity (Covington & Taylor, 1991; Hanson *et al*., 2000; Katz *et al*., 2003; Merry, 1981; Taylor & Hale, 1986). With global questions it is important not to assume that people stay home at night because they are afraid of crime, but rather for a diverging array of other reasons (LaGrange & Ferraro, 1987).

There are ambiguities even when 'crime' is mentioned (Ferraro & LaGrange, 1987). Fear varies with the type of crime under consideration, for example it depends on whether the crime involves a threat to one's personal well-being or damage to one's property (Skogan & Maxfield, 1981). In terms of personal crime, experiences of fear differ if for instance, rape or robbery is considered. Global measurement questions conceal any differences in the level of fear of these different crimes (Ferraro & LaGrange, 2000). A lack of crime specificity in survey questions forces respondents to select their own conceptual references. This choice differs between people and therefore respondents' answers may not be comparable (Ferraro & LaGrange, 2000). Ferraro & LaGrange (1987) argue that the lack of crime specificity in global measurement questions overrides any of their usefulness as fear of crime measures.

Additionally, the geographical frame of reference of global measurement questions, the 'neighbourhood', is not sufficiently defined and can be envisaged differently by different people (Ferraro & LaGrange, 2000; LaGrange & Ferraro, 1987). For instance, those respondents completing the same fear of crime survey may reside in completely different neighbourhoods and thus be referring to a separate environment in their response. For those respondents actually even living in the same neighbourhood their ideas of the boundaries of that neighbourhood may be quite discordant. This inhibits comparison of respondents' answers. Furthermore, assuming that each respondent reflects on the same neighbourhood when answering the global measurement question, it is still unclear whether they are fearful in the entire neighbourhood or only certain part/s of it. This is particularly relevant when you consider that crime levels and rates fluctuate dramatically within urban neighbourhoods (LaGrange & Ferraro, 1987).

Lastly, survey items asking respondents 'do you feel, or would you feel' merges reality with the hypothetical, thereby creating a double-barrelled question[94] (LaGrange & Ferraro, 1987). LaGrange and Ferraro (1989) argue that it is methodologically inappropriate to use hypothetical scenarios since it is difficult for respondents to evaluate how they would feel (Ferraro & LaGrange, 2000).[95] In addition, this hypothetical scenario may exaggerate fear of crime levels because it could seem excessively threatening (LaGrange & Ferraro, 1989). Thus, they state researchers should focus on how individuals feel in everyday situations when examining fear of crime (Ferraro & LaGrange, 2000).

[94] LaGrange & Ferraro (1987) assert that this question actually "becomes two distinct (although related) questions for different sub-samples of respondents". These two sub-samples comprise of those who do go out alone at night and those who do not go out alone at night. For those respondents who do go out, the question "has concrete meaning based on actual experience" (LaGrange & Ferraro, 1987). For those respondents who do not go out, the question is far more "hypothetical and abstract" (LaGrange & Ferraro, 1987). It is likely that this is the sub-sample that a majority of survey respondents will fall into, as walking alone at night is not a routine activity for most (Cohen & Felson, 1979 in LaGrange & Ferraro, 1989; Ferraro & LaGrange, 2000).

[95] People may also fit into each of LaGrange & Ferraro's (1987) sub-samples depending on the specific part of the neighbourhood they concentrate on (an area they do or do not go out alone in). Depending on which of these areas is conceptualised, the question might further elicit very different reactions in the one respondent.

2.4.1.2.b. Value or concern-based measures

Closely aligned with global questions are those value or concern-based measures. The terms worry and concern are often interchanged with fear in social surveys (Skogan & Maxfield, 1981 in LaGrange & Ferraro, 1987). However, instead of targeting emotional levels of fear these questions evaluate people's opinions of the seriousness of the level of crime in their neighbourhood (Furstenberg, 1971). Furstenburg (1971) provides the example of asking respondents to, "choose the single most serious domestic problem (from a list of 10) that you would like to see government do something about". Another simpler version involves asking respondents if they are personally concerned about becoming a victim of crime (Jaehnig *et al*., 1981 in Ferraro & LaGrange, 1988). As discussed in section 2.1.2, people's concern or worry about crime is distinctly different from their fear of crime. People who are troubled by the problem of crime are not necessarily afraid of being personally victimised (Furstenberg, 1971).

2.4.1.3. Improvements through affective approaches to measuring fear of crime

While cognitive approaches to measuring fear of crime involve people making judgements about how safe they feel, affective approaches aim to elicit more of an emotional response. Thus they aim to measure 'fear of crime' in a more literal sense, as described in section 2.1. 'Emotion-based measures' is the most common term given to these approaches in the literature.

2.4.1.3.a. Emotion-based measures

In contrast to global measures and other types of cognitive approaches to measuring fear of crime, emotion-based measures make explicit reference to a specific crime (Ferraro & LaGrange, 2000). In doing this, they target 'concrete' fear by eliciting a personal, emotional reaction from the respondent (Ferraro & LaGrange, 1987; Rountree & Land, 1996; Scott, 2003). While this reaction may also depend on perceived risk, it is distinct from judgments or concerns about crime (Ferraro &

LaGrange, 2000). Emotion-based questions include 'how afraid are you of becoming a victim of …' (Mawby *et al*., 2000; Rountree & Land, 1996). Respondents answer by choosing from a list of options such as I feel 'very afraid', 'fairly afraid' or 'a bit afraid' (Skogan, 1999). These questions allow respondents to visualise themselves as victims of the crime (Reid *et al*., 1998).

The extent of the fear elicited by the specific crime mentioned in the survey question will depend on a number of factors. Fear of crime is initially based on the nature[96] and perceived seriousness[97] of the offence in question (Clark, 2003). Different communities, social groups and individuals will interpret the nature and seriousness of different crimes differently (Clark, 2003). Equally, the level of fear one feels when thinking about a specific crime is determined by the perceived likelihood of that crime occurring (Clark, 2003).[98] Fear is also influenced by an individual's risk sensitivity to the crime in question (Clark, 2003; Warr 1987; Rountree & Land, 1996).[99] Each of these factors are subconsciously assessed when a person thinks about a crime. They therefore affect the extent of the fear response, pointing out the importance of crime specificity (Clark, 2003).

By making reference to a specific crime and eliciting these personal considerations, emotion-based measures effectively overcome many problems with global measurement

---

[96] Clark (2003) argues that the "nature of crime is inherent in the offence itself as well as its consequences". She demonstrates this by pointing out the difference between the two categories of assault, that of grievous bodily harm and common assault. By definition, grievous bodily harm is a type of assault that results in "any permanent or serious disfiguring of the person". Clark (2003) discusses the nature of grievous bodily harm, identifying it as being a crime of severe and long-term harm. In comparison, common assault is relatively minor, occurs more frequently and inflicts minimal harm on the victim (Clark, 2003). The nature of this crime, being one of only slight, short-term, harm, is very different to the other category of assault (Clark, 2003).

[97] When differentiating the perceived seriousness of a crime from its nature, social norms and legal definitions are considered, with respondents generally answering in terms of how serious they think the legal system considers it to be (Clark, 2003). They draw on formal definitions and perceptions of crime discussed in section 2.1.5. Clark (2003) mirrors theorists of the signal crimes perspective in saying that "judgements are strongly based in the societal context in which a person lives" (Clark, 2003). However, she also says perceptions of crime seriousness are dependent upon the socio-economic status of different individuals (Clark, 2003). Different people will also perceive the nature of a crime differently (Clark, 2003). This is partly based on their vulnerabilities, their perceived ability to cope with the consequences of victimisation (Clark, 2003).

[98] While murder is a serious crime, the likelihood of that crime occurring is lower substantially, officially and perceptually, than for most other crimes, such as robbery (Clark, 2003). Fear is therefore higher for crimes that are serious and likely to occur (Clark, 2003; Warr, 2000).

[99] Warr (1987) states "'sensitivity' to risk is inherent in an offense" (cited in in Clark, 2003). Fear of crime will be greater for those people who are sensitive to risk (Clark, 2003).

questions. However, they also result in highly subjective responses. People have differing perceptions about concepts like 'a bit afraid'. Two respondents who state they feel 'somewhat afraid' may react completely differently, and therefore comparative analysis of cognitive and affective comments are problematic. This problem, and the hypothetical nature of the questions used, restricts the utility of emotion-based measures to certain contexts. Few studies have gathered crime specific data on fear and those that have, generally rank crimes according to the level of fear that they produce (Warr, 2000).

2.4.1.4. Benefits of behavioural approaches to measuring fear of crime

Ditton, Bannister, Gilchrist and Farrell (2000) criticise fear of crime research as being "trapped within an overly restrictive methodological and theoretical framework". Warr (2000) also states that "the study of fear seems to have stalled at a rudimentary phase of development, a situation that is in danger of turning into outright stagnation". There is little development due to continual use of these problematic cognitive and affective-based questions in surveys (Ditton *et al*., 2000; Warr, 2000).

In order to develop more unambiguous fear of crime measures, researchers are more recently studying its affect on behaviour. Many studies find that people respond to fear by modifying their behaviour (Samuels & Judd, 2002; Tulloch, 2000; Warr, 2000).[100] As Skogan (1999) indicates, fear is validated when it manifests through behaviour. Behavioural approaches eliminate much of the subjectivity associated with responses from cognitive or affective questions. By focusing on fear of crime through behavioural responses, researchers can measure and compare fear more reliably than otherwise. In fact, Hale (1996) argues that behaviour is a more accurate guide to fear levels than reported statements about fear level. This notion prompted Warr (2000) to state, "behaviour may be the best indicator of fear". Behavioural approaches examine

[100] Emotions are defined by subjective experiences or feelings and are often coupled with physiological changes, expressions and purposeful behavioural actions (Oatley & Jenkins, 1996). The core of emotion is readiness to act and therefore many researchers state the best way to study emotion is through emotional behaviour (Carlson & Hatfield, 1992; Oatley & Jenkins, 1996).

the protective actions and avoidance strategies adopted by people attempting to reduce fear (Gabriel & Greve, 2003; Samuels & Judd, 2002; Tulloch, 2000).

2.4.1.4.a. Protection-based measures

People who are afraid of crime, either in their home environment, or out in their neighbourhood, are likely to use self-protection (Ferraro, 1995; Tewksbury & Mustaine, 2003). To determine the types of self protection employed by survey respondents, they are usually asked questions such as "in general have you limited or changed your activities in the past year because of crime (yes or no)" (Liska *et al*., 1988). A list of protective actions from which respondents can then choose is often provided (see DeFronzo, 1979; Gray & O'Connor, 1990; Sundeen & Mathieu, 1976). Protective actions are employed to either limit one's exposure to risk or reduce their chances of being victimised when they are exposed to risk (Skogan & Maxfield, 1981). Many of these actions also therefore make people feel less afraid of crime (Vacha & McLaughlin, 2004).

Protective actions generally include individual coping strategies or collective actions. Individual coping strategies are diverse and extensive. In terms of protection against property crime, people adopt 'target hardening efforts', which create physical and psychological barriers to stop victimisation (Skogan & Maxfield, 1981).[101] The individual coping strategies that people employ to protect themselves against personal crime vary from arming oneself with weapons to being vigilant around potential offenders.[102] Collective actions that are used to protect against crime, and consequently

[101] People create physical barriers for offenders to overcome by locking their doors when leaving home (Warr, 2000), installing extra security locks, bars and systems (Carvalho & Lewis, 2003) and keeping trained watch dogs (Williams *et al*., 1994). Psychological barriers to deter offenders are also employed such as the installation of car and home alarms (Reid *et al*., 1998), and the leaving of lights or times appliances like radios and television sets on at home when they are out (Krahn & Kennedy, 1985; Warr & Ellison, 2000). Other coping strategies that protect against or minimise the negative consequences of property loss and damage include the engraving of valuables and the purchase of theft and vandalism insurance (Williams *et al*., 1994).

[102] For example these commonly include the carrying of a weapon such as a handgun or mace to use when warding of or defending against an attacker (DeFronzo, 1979; Kenney, 1987; Reid *et al*., 1998). Personal alarms and whistles are also carried to drive away attackers and alert passers-by of the problem. For those that choose not to arm themselves in anyway, they often simply increase their level of alertness (Reid *et al*., 1998) and walk faster during those moments of fear. They may also choose to drive a car or use other 'safe' methods of travel through

fear of crime, often transcend the boundaries between personal and property crime. A widespread response is people walking in pairs or groups when in feared areas (Carvalho & Lewis, 2003; Nasar *et al*., 1993). Other collective actions include the organisation of 'neighbourhood watches' (Reid *et al*., 1998). Williams, Singh and Singh (1994) find that these collective actions are more common than personal coping strategies.

2.4.1.4.b. Avoidance-based measures

As discussed earlier, avoidance is documented as one of the most frequent behavioural responses to fear of crime (Garofalo, 1981). Avoidance refers to "those actions taken to decrease the chance exposure to crime by removing or distancing oneself from situations in which the risk of victimisation is perceived to be high" (DuBow *et al*., 1979). Often people restrict their travels to safe places at safe times or refuse to leave their homes at all, particularly during the night (Pantazis, 2000; Samuels & Judd, 2002). Some residents even choose to avoid the neighbourhood altogether by moving (Carvalho & Lewis, 2003; Reid *et al*., 1998). Because avoidance is held responsible for many of the negative consequences on affected communities, avoidance-based measures are pertinent to the study of fear of crime and any associated fear reduction strategies.

As mentioned, research into avoidance generally involves asking respondents if they avoid any areas because they feel unsafe (Ditton, 2000) or something similar to "do you avoid certain places and areas of the city because of the possibility of crimes of violence" (Gomme, 1986). The response to these avoidance-based items in fear of crime surveys predominantly features only a yes or no possibility. Therefore these studies have only been useful for broad level macro analyses of fear of crime and avoidance behaviour. However, avoidance-based questions more recently include a spatial element, with a request that those avoided areas be illustrated on a map (Doran & Lees, 2003; Nasar *et al*., 1993; Nasar & Jones, 1997). Asking survey respondents to map avoided areas incorporates a spatial reference to fear of crime studies. These studies, and the benefits of fear mapping and spatial analysis are discussed in section

---

feared areas rather than walk (Warr & Ellison, 2000). When at home people may also refuse to open the door to a stranger (Warr, 1985).

2.4.2.2 of this chapter. Given this, it is appropriate that mapping restricts the scope of the question to a geographic reference that is defined and common to all respondents. This means responses compare more accurately than those referring to a 'neighbourhood'.

Despite these benefits, the utility of behavioural measures has been limited because they have been trapped within the global measurement framework. For example, respondents are asked whether they employ protective or avoidance reactions because 'they feel unsafe'. Thus, with a lack of crime specificity they are restricted in their usefulness by many of the problems discussed in section 2.4.1.2. In comparison to the multitude of cognitive and affective studies, relatively little information has been collected on the behavioural reactions adopted by people in response to fear of crime, especially in response to fear of different specific crimes (Reid *et al.*, 1998). Additionally, little is known about the different socio-demographic groups who employ such measures and if the use of self-protection or avoidance is related to an individual's proximity to potential offenders (Tewksbury & Mustaine, 2003).

2.4.1.5. Topic review: A preference for avoidance-based fear studies

Despite considerable methodological inconsistencies, researchers have measured fear of crime using four main approaches. Psychologists measure fear of crime by monitoring people's psychophysiological reactions. This is not very practical for fear of crime studies, being time consuming, expensive and difficult to conduct at a large scale. The cognitive approach to measuring fear of crime is easy to carry out. However, both the global and value or concern based measures are limited in their utility because they do not target actual 'fear' of crime. The wording of survey questions also result in responses that are difficult to interpret. While the affective approach to measuring fear of crime does target people's emotional fear of crime, it too results in ambiguous and subjective findings. Despite these restrictions, cognitive and affective approaches to measuring fear of crime have been useful for broad level analyses. In contrast, behavioural approaches to measuring fear of crime overcome much of the subjectivity and ambiguity inherent in cognitive and affective based survey responses. Behavioural approaches, particularly avoidance-based measures, can also produce site-specific results. This means they can be used to introduce a spatial dimension to analyses. The

spatial visualisation of fear of crime, and traditional non-spatial statistical analyses, are discussed in the following section of this chapter.

2.4.2. Differences in the analysis of fear of crime data

The analysis of fear of crime is as controversial and contrasting as the numerous approaches used to measure it. Fear of crime is most commonly analysed using traditional statistical techniques, which is firstly discussed in this section. A more recent approach to the analysis of fear of crime involves mapping. The concepts of fear mapping and spatial visualisation are discussed second. This section then provides a brief history of these analysis procedures and discusses some case examples.

2.4.2.1. Inconsistencies in statistically analysing fear of crime

A variety of statistical models are used to analyse population data in fear of crime studies. Traditionally, simple bivariate analyses dominate the field, with researchers using Pearson's correlation co-efficient (r), Spearman's rank (r) and Chi-Square analyses. More recently, studies acknowledge the multi-dimensional nature of fear of crime, concentrating on the interactions between a multitude of dependent variables and fear of crime (Box *et al.*, 1988; Carcach & Mukherjee, 1999; Ferraro & LaGrange, 1987). These variables are predominantly socio-demographic groupings, for example sex and age. Many researchers now use multivariate statistical techniques (Box *et al*, 1988).

However, with operationalisation differences alternative models maintain conflicting or dissonant results, even when examining the same dataset (see LaGrange & Ferraro, 1989). Without evaluating the advantages and disadvantages associated with the numerous previous models, these conflicting results illustrate the need for more standardised modelling methods in fear of crime research.[103] These traditional statistical-based studies are aspatial in nature, due to their cognitive or affective

[103] Then again in stating a need for consistency in analysis methods, it is important to note Maxfield (1984), who ague that no single model should sit across different neighbourhoods (cited in Box *et al*, 1988).

measurement approaches. The overuse of this type of research is heavily criticised. In contrast, spatial visualisation of fear of crime data can transform the current state of research from a 'stagnant' field to a contemporary field providing new information for fear reduction strategies (Warr, 2000).

2.4.2.2. Advantages of spatially visualising fear of crime

The spatial visualisation of fear of crime arguably provides more information than conventional statistical models and methods of analysis. Many researchers acknowledge a distinct spatiotemporal element to crime and fear of crime, which researchers should be sensitive to (Gold & Revill. 2000; Lemanski, 2004; Moran *et al*., 2003; Warr, 2000). Lupton and Tulloch (1999) expand by calling for research that explores the "dynamic situated and micro-contextual contexts in which fear of crime is generated and experienced" (Lupton & Tulloch, 1999). By doing this through spatial visualisation, fear of crime findings can be integrated with an understanding of the social and physical environment (Pain, 2000). Samuels and Judd (2002) elaborate in the following comment:[104]

> "Mapping provides a spatially-focused base for the interpretation of social indicators in their epidemiological context. Maps are setting specific, temporary sensitive, visual-diagnostic tools … allowing situational experience to be interpreted in light of the theory and practice of environmental design and community empowerment criminology".

Ashby and Longley (2005) state that these 'geodemographic' analyses lead to significantly increased police intelligence.[105] For example, the spatial knowledge of fear of crime and avoidance patterns allows for the targeting of limited resources to specific hotspots. Such locally tailored responses are also more likely to be effective than generalized strategies (Kitchen, 2002; Nelson *et al*., 2001; Skogan, 2004). In light of this, Fisher (1995) believes that fear of crime studies missing a spatial element are vague and less informative than those that do.

[104] While this comment relates to the appropriateness crime mapping, it also justifies mapping fear of crime.
[105] They also state that geo-computational research is vital to the creation of small area profiles that are becoming central to efficient and effective deployment of resources by public services (Ashby & Longley, 2005).

Despite these benefits, few researchers have ventured into the world of spatial visualisation through fear mapping. Fear mapping is already used to investigate the links between crime, fear of crime and space. This is primarily to establish causal links or relationships between certain environmental cues and fear of crime, as detailed later in this chapter (Doran & Lees, 2005). Fear mapping with respect to environmental cues is also relevant in combating fear of crime. For example, councils can use fear maps to determine priority areas for development, and environmental cues to be designed out of town plans. Mapping also permits comparison of avoided areas in order to spatially investigate which socio-demographic groups are more likely to adopt avoidance strategies in response to fear of crime. Through the comparison of geographic areas, it is possible to objectively determine which socio-demographic groups are more afraid. Toseland (1982) states that this could assist special efforts targeting these vulnerable groups. At a macro scale, the spatial visualisation of fear hotspots also allows for an investigation into the proposed idea that fear of crime is predominantly an urban, rather than rural, problem (Cates *et al*., 2003; Miceli *et al*., 2004; Yarwood, 2001). Therefore, fear mapping has the potential to provide more information than traditional statistical approaches. Fear mapping has its routes in cognitive mapping[106] and investigations of spatial cognition and behaviour, which are discussed next.

2.4.2.2.a. Spatial cognition: A background

An understanding of how people develop cognitive maps, and how spatial cognition influences spatial choices and behaviour, is highly relevant to environmental criminology (Brantingham & Brantingham, 1993). Cognitive mapping assists people in making spatial choices, like determining which areas in which to commit crime or to avoid due to fear of crime (Brantingham & Brantingham, 1993; Downs & Stea, 1973; Liben, 1981). Cognitive mapping also enables the use of fear mapping, and therefore a background in spatial cognition[107] is provided. A cognitive map is a mental copy of

[106] Cognitive mapping is "a process composed of a series of psychological transformations by which an individual acquires, codes, stores, recalls and decodes" spatial knowledge (Downs & Stea, 1973). The spatial knowledge about phenomenon is encoded to memory as the representation of Euclidean space and relations (Block, 1998; Sholl, 1996).

[107] Freundschuh (1998) believes understanding spatial cognition requires an understanding of spatial behaviour. Conversely, understanding spatial behaviour requires an understanding of spatial cognition.

one's environment, featuring information about the relative spatial location, arrangements and properties of 'phenomenon' (Block, 1998; Downs & Stea, 1973; Sholl, 1996). Such phenomenon include behaviourally relevant 'landmarks' that are visible reference points, like buildings, parks or street junctions (Nasar, 1998).[108] Spatial cognition involves the attribution of denotative meaning, or object recognition, to this phenomenon (Nasar, 1998).

Space is not considered only in terms of the physical environment (Koskela & Pain, 2000). Activities, specific events and processes become associated with the environmental context in which they take place (Koskela & Pain, 2000; Valentine, 1989). For example, a laneway may be associated with drug dealers. Therefore, when shaping and recalling information stored in one's cognitive map, a person is aware of the environment as having distinct social and physical attributes (Burnett, 1976; Downs & Stea, 1973). Thus character plays a vital role in social cognition and functions as an effective cue in retrieving spatial information (Tversky & Talyor, 1998). Space and events in space are intimately connected the perception of time (Block, 1998). Therefore, landmarks and objects often have temporal properties and relationships (Block, 1998). As part of spatial cognition, or spatio-temporal reasoning, the "appearance, change, and disappearance of things in space and over time" is considered (Couclelis, 1998).[109] Thus, the presence of night in a particular environment (represented by darkness rather than a measurement of time) can trigger new attributes to be associated with that environment. Using the above example, the drug dealers in the laneway during the day may move to another location at night.

Cognitive mapping is not only shaped by the physical, social and temporal properties of space, but also by one's mental state (Orleans, 1968). The mind is the home of a person's emotions, attitudes, needs and desires. The process of evaluating an environment is a function of these factors (Burnett, 1976; Orleans, 1968). This evaluation involves judgment and the assigning of a connotative meaning to the

[108] Four other types of phenomenon give identity to space (Nasar, 1998). These firstly include nodes, which are centres of activity that people travel to and from, and paths, which are the channels of movement or streets through such areas (Nasar, 1998). Districts are large recognisable spaces, for example 'Little Italy' in Sydney's inner-east (Nasar, 1998). Districts are sometimes defined by the last type of phenomenon, edges, which are boundaries like rivers, railroad cuts and walls (Nasar, 1998).

[109] Tversky and Talyor (1998) supplement this by saying that time, as well as space, is an effective cue in retrieving information about the attributes of phenomena.

different phenomenon and social activities within that environment (Husserl, 1973; Nasar, 1998). Continuing the previous example, onlookers could perceive the drug dealers as threatening; thereby connoting risk, or harmless. They would take appropriate action depending on their judgment.

While assessing the possible courses of action, and making a spatial choice[110], cognitive information will also be affected by one's past experiences, present beliefs and especially the future expectations concerning the outcome of such a decision (Burnett, 1976; Downs & Stea, 1973; Kitchin, 1996; Kaplan. 1973; Jeffery, 1971; Mennis, 2003). In circumstances where onlookers perceive the drug dealers to be threatening, the concept of risk becomes attached to that specific laneway and the person may consequently avoid it (Nelson *et al*., 2001). The laneway then signals the need for avoidance and becomes an *anchor point*, which is similar to a landmark only more personal and salient in one's cognitive map (Block, 1998, Couclelis *et al*., 1987). This avoidance behaviour therefore continues even in the absence of the original drug dealers.

In conclusion, spatial behaviour is the result of the complex processes of spatial choice. Spatial behaviour[111] and spatial choice are dependent on one's cognitive map of the spatial environment (Burnett, 1976; Downs & Stea, 1973; Freundschuh, 1998). Spatial behaviour is therefore a response to both the real and subjective worlds (Kitchin, 1996). However, despite the rational calculation involved in behaviour, inferences and spatial choices can be made without conscious thought (Nasar, 1998).

2.4.2.2.b. Fear mapping: A background

As mentioned previously, cognitive mapping techniques have been successfully adapted to investigate fear of crime and develop fear mapping methodologies. The study of cognitive mapping originally involved evaluating environmental cognition by asking individuals to illustrate their mental maps of geographic regions, with landmarks,

[110] Spatial choice is a function of knowledge one's location, what is likely to occur, whether it will be good or bad and possible courses of action (Nasar & Jones, 1997).
[111] Spatial behaviour is "any form of human behaviour that involves or exhibits an interaction between the individual and one or more points in space" (Louvierre, 1976).

on paper. In line with this, Steinitz (1968) mapped 'denotative meanings', or people's knowledge of a city (cited in Nasar, 1998). Later, environmental assessment became of interest where connotative meanings were mapped, or people's feelings regarding places and activities in different areas of a city (Nasar, 1998). By 1972, Newman (1972) created one of the first fear maps showing a site plan of designs that residents designated as dangerous. A year later, Gould produced a crude fear map of Philadelphia (cited in Nasar, 1998).[112] In their various papers written approximately 15 to 20 years later, Fisher and Nasar made considerable contributions to the growth of fear mapping and the linking of certain environmental cues to fear of crime (Fisher & Nasar, 1992; Fisher, 1995; Nasar *et al*., 1993; Nasar & Jones, 1997). In their 1990 'observations of behaviour' study, Fisher and Nasar (1992) observed pedestrian activity to determine if people avoid walking in or near areas they judged as unsafe. By examining the most heavily avoided sites, they conclude people avoid low-prospect/high-refuge areas.

In 1991, Nasar, Fisher and Grannis (1993) extended this research. Respondents were asked to circle areas that they avoided on a map. These individual maps were then aggregated and a coarse hierarchical map of fear produced. This was then used in more site-specific analyses of the links between feelings of safety and concealment, prospect and escape. Fisher and Nasar (1995) slightly amended this method in their later study, wherein they asked respondents to rate their perceived level of safety in eight pre-designated areas on the provided map. The results similarly showed fear spots occurred at the microlevel. Again, Nasar and Jones (1997) explored fear mapping by asking respondents to tape record their feelings of safety when walking through the study site. Sites where respondents felt unsafe were documented on a map and aggregated to show the spatial distribution of fear comments by percentage. However, more recently Nasar (1998) comments that for increased accuracy he proposes the use of GIS in fear mapping.

[112] In 1976, Milgram and Jodel*et al*so mapped perceived areas of danger in Paris (Nasar, 1998). Also, in 1977 Duncan (1997) mapped New York's feared neighbourhoods (Oc & Tiesdell, 1997).

2.4.2.2.c. Geographic Information Systems in fear mapping

Geographic Information Systems are automated information systems which are based on data referenced by geographic coordinates (Maruna *et al*., 2004). More specifically this data, or geographic information, is referenced to locations on the earth's surface (Martin, 1991). However, this information not only includes the location of spatial objects, but also their attributes (Ding & Fotheringham, 1992).[113] Mapping through GIS is therefore particularly useful when studying large and complex data with multiple attributes, where conventional inferential statistics and pattern recognition algorithms may fail (Kwan, 2000).

Doran and Lees (2003) illustrate that GIS are an appropriate tool for examining the potential links between crime, disorder and fear. The ability of GIS to work with different types of datasets and with information stored in different file formats is particularly useful for researchers examining data from various sources (Murray *et al*., 2001). For example it readily combines spatial survey data with demographic, social and economic data (Drummond, 1995). This integrative capacity allows GIS to generate "more complex and realistic representations of the urban environment than conventional methods" (Kwan, 2000). Information is efficiently managed and stored within a GIS. Data is easily manipulated, updated or integrated with additional information relevant to future projects. This is also practical as the use of spatial data and analysis is expanding in numerous research and planning based organisations. Martin (1991) comments that it is not only the far greater power for manipulation and analysis that sets GIS apart from earlier systems, but the increased demands on data accuracy and availability.

GIS further allows the manipulation of high volumes of data and the display of that data in meaningful yet simplified maps (Ratcliffe & McCullagh, 2001). The various visualisation techniques that GIS support facilitate exploratory spatial data analysis and the identification of spatial patterns or relations that are not necessarily apparent using

[113] GIS manage the geographic information in a complex geographic database that comprises of a set of procedures for the import, storage, manipulation and output of that geographic information (Martin, 1991). This allows questions to be asked of the data, thereby obtaining information about the real geographic world (Martin, 1991). GIS are described as 'systems' because of this capacity.

other means (Ratcliffe & McCullagh, 2001; MacEachren *et al*., 1999; Ratcliffe, 2001). This particular capacity of GIS is exploited in this thesis, with the development of a three-dimensional visual-diagnostic technique to map fear of crime.

Additionally, governments and police already use GIS when conducting development plans and analysing crime. For example, the police use GIS in the manipulation of complex spatial data for the development of crime pattern models and hotspot analyses (Ashby & Longley, 2005; Baker & Wolfer, 2003; Bowers *et al*., 2004; Murray *et al*., 2001; Nelson *et al*., 2001; Russo, 2001; Weisburd *et al*., 2004; Yarwood, 2001). Therefore they have the technology and expertise necessary to apply the mapping technique developed in this research.

2.4.2.2.d. Fear mapping: Two case studies

Since the mid 1990s[114], few researchers have used fear mapping in their analyses. Doran and Lees' (2003), and Darcy's (2003) mapping projects provide the foundation for this research project. These are two Australian studies, based in Wollongong and Kings Cross respectively, which use GIS in the mapping of fear. While both studies employ GIS, there are important distinctions between them.

Firstly, the projects use very different measurement approaches when questioning the survey respondents about their fear of crime.[115] Doran and Lees employed a crime-specific avoidance-based approach, asking respondents to indicate areas that they avoided because they were afraid of being robbed, beaten or attacked. Darcy employed a more traditional global approach to measuring fear of crime, asking respondents to indicate sites where they feel unsafe. Doran and Lees' maps therefore show areas collectively avoided by the respondents, whereas Darcy's maps show sites where the respondents felt unsafe.

Secondly, both Doran and Lees' (2003), and Darcy's (2003) studies sought further supplementary fear of crime information. Doran and Lees asked respondents how hard

[114] With Fisher & Nasar, 1992; Fisher, 1995; Nasar & Fisher, 1992; Nasar *et al*., 1993; and Nasar & Jones, 1997.
[115] This illustrates the lack of methodological consistency that dominates the research field.

they tried to avoid the areas, thus adding a weighted value to the areas of fear identified. Darcy questioned the respondents regarding which environmental cues triggered them to feel unsafe, thus determining why the respondents are afraid. As Doran and Lees' survey was longitudinal in nature, requiring more in depth individual questioning, a small sample size was gained. In contrast Darcy obtained a large sample of participants, collecting enough data to enable the spatial analysis of fear experienced by different socio-demographic groups.

While the projects brought much new information to the field, they were limited by the techniques used to visualise the spatial fear data. In Darcy's project the fear maps disproportionately represent the areas people felt unsafe. This resulted from the method used to interpolate the survey point data into the grid data, which was necessary in producing a series of thematic maps showing areas where certain numbers of individuals felt unsafe. Additionally, the coarse cell size of $100m^2$ means a micro-scale analysis of the study site could not occur. Doran and Lees produced realistic avoidance hotspots, with a cell size of $10m^2$. However, the resulting index showing avoidance intensity fails to display much of the information present in the 'avoidance density' and 'avoidance hardness' data. This is because of the method used to combine the avoidance density data, showing how many people avoid each area, and the avoidance hardness data, showing the extent to which they try to avoid each area.

2.4.3. Section synopsis: A new direction with avoidance mapping

The literature presents numerous problems with cognitive and affective approaches to measuring fear of crime, which can be overcome by using behavioural measures. In particular, avoidance-based behavioural measures can be used in spatial investigations into fear of crime. Spatial investigations can provide new and useful information that cannot be gained through traditional statistical analyses. For example, spatial visualisation can easily identify patterns in the distribution of fear of crime. This is particularly useful for policy, planning and localised implementation of fear reduction strategies. Despite these benefits, few researchers have spatially investigated fear of crime. Researchers who have used fear mapping generally employ global measurement styles of questioning or produce unrealistic maps representing feared areas. This points

to an opening for new studies to spatially investigate fear of crime using avoidance-based measures.

2.5. Summary of Literature Review

This literature review has discussed the difficulties in defining fear of crime, the various factors associated with fear of crime, how fear of crime is a social problem, approaches to combat fear of crime, and the different methodologies for investigating fear of crime. The next chapter, the Research Approach, will draw the literature together when outlining the approach used to study fear of crime in this thesis.

3. Research Design

This chapter discusses the research aims and approach.

3.1. Research aims

This study examines where and when people are afraid of crime in Kings Cross. It specifically aims to provide an exploratory study into the environmental cues that trigger people to feel afraid of being robbed, beaten or attacked. It investigates the hypothesis that the spatial visualisation of avoidance and perceived environmental cues can provide new information concerning public fear of crime.

3.1.1. Theoretical approach

The fields of criminology and geography influenced this study, which took an environmental approach to examine fear of crime. This study specifically drew on the disorder/incivilities and threatening and safe environments theories to investigate how different environmental cues trigger fear of crime. An environmental perspective was chosen because environmental cues can be managed in fear reduction strategies, making such studies particularly pertinent to policy, planning and practice. This study also touched on the signal crimes perspective in an exploration of the patterns of avoidance triggered by different environmental cues. With the majority of studies explaining fear of crime using other theoretical approaches there was an opportunity for a new environmental study. This study was unlike earlier environmental studies because it used different conceptual and measurement approaches, as discussed next.

3.1.2. Conceptual approach

This study is based on a clear-cut definition of fear of crime that defines fear of crime as a combination of its parts, 'fear' and 'crime'. The 'fear' in 'fear of crime' is recognised as a distinct, negative emotion that describes feelings of dread and anxiety, is characterised by an expectation of danger and is produced by a threat of physical harm. The 'crime' in 'fear of crime' is identified as any act that is a violation of criminal law. This is a study of fear caused only by threats to the existence or well-being of the person feeling the emotion. Therefore the 'crime' in 'fear of crime' stands for 'criminal victimisation'. This study is specific in its approach, with the survey respondents being questioned about their fear of being robbed, beaten or attacked. However, while this study is crime-specific, it is acknowledged that fear of crime can be triggered by environmental cues, for example acts of disorder, that do not indicate violations of criminal law.

3.1.3. Measurement approach

A behavioural approach to measuring fear of crime was employed in this study. It is recognised that fear of crime is often manifested behaviourally in the individual and that this behavioural component can be easily measured. A behavioural approach was chosen because these measures overcome much of the subjectivity associated with interpreting responses from cognitive or affective measurement approaches. The study specifically involves an examination of the avoidance reaction to fear of crime, as avoidance is a common and potentially problematic component of fear of crime. Additionally, an avoidance-based measure was chosen because measuring fear of crime through its affect on avoidance permits the mapping of avoided areas. This allows the opportunity for the provision of new and useful information through visualisation and geographic referencing.

3.1.4. Research setting

The geographic location for the research was chosen because of the following characteristics. First, the setting needed to be in a high crime or fear of crime area. The local community, police and council would ideally be interested in reducing fear of crime. Community interest would increase the likelihood of public participation in the survey. Police and council interest would increase the likelihood that any informative research findings from this study could be used in policy, planning and practice. This would be particularly the case in an area currently undergoing gentrification. Lastly, a high-density and easily accessible area was sought so that a large sample could be easily gathered. The chosen research setting was Kings Cross, NSW, and is described in the first methods chapter.

3.1.5. Survey design

The survey used in this study (outlined in the second methods chapter) was based on those used in two previous studies. Doran and Lees' (2003) survey was extended significantly to reflect a new research setting and broader research aims. A questionnaire section of the survey was used to obtain the sample characteristics needed when examining the effect of different environmental cues on the fear of crime experienced by different socio-demographic groups. A mapping component of the survey allowed the survey respondents to illustrate areas within the study site that they avoid, therefore relying on cognitive mapping. A refined version of Darcy's (2003) survey methods for obtaining information on perceived environmental cues was incorporated into this part of the survey.

3.1.6. Interviewing approach

The data collection phase of this study involved interviewing members of the public using a survey (also described in the second methods chapter). Standardised interviewing was chosen because the presence of an interviewer overcomes many of the problems with self-administered surveys. A public street setting was chosen so that visitors and residents of the area could be interviewed. Safety concerns for the interviewers also prevented door knocking as a recruitment option. Thus a true representative sample of the local population could not be obtained. Regardless, it is not the intent of this study to make inferences about a population and therefore a comparatively large convenience sample was adequate.

3.1.7. Data visualisation and analysis approach

This study addressed an opening for more research designed to examine the spatial dimension of fear of crime and explore the potential avoidance mapping has for providing new and useful information not provided using traditional statistics. A GIS was chosen to produce the avoidance maps in this study, which were used to examine of the spatial distribution of avoidance triggered by perceived environmental cues. These maps were created using an uncomplicated method of spatial visualisation that can be easily replicated by council and the police. Detailed information on this visualisation technique is discussed in the last methods chapter.

3.2. Summary of the research design

This chapter has established the research aims of this study, clarified the research design in light of the literature discussed in the previous chapter, and introduced the research setting. The research design indicates this study employs a crime-specific avoidance-based approach in conducting a spatial investigation into 'fear' of 'crime' in Kings Cross. This approach is used to explore the environmental cues that trigger people to feel afraid of being robbed, beaten or attacked. It is hoped new information concerning public fear of crime is produced, which has useful implications for theory, policy, planning and practice. The next three methods chapters will detail the actual methods undertaken in this study to examine the fear of crime.

4. Methods: Research Setting

This is the first of three chapters describing the research methods. This methods chapter specifically describes the research setting, Kings Cross. This chapter explains why this setting was chosen and describes the geographic location, historical background and demographic characteristics of Kings Cross. An introduction to crime and fear of crime in the region is also presented. The following two methods chapters respectively describe the survey design and implementation, and the fear mapping technique.

4.1. Site justification

Kings Cross was primarily chosen as the research setting because it is recognised by both the public and the NSW Police as a high crime area (Darcy, 2003; Tulloch *et al*., 1998). In line with state-wide objectives of investigating and combating crime and fear of crime, the NSW Police trialled a fear mapping project in Kings Cross in 2003 (Darcy, 2003). They were keen to see more fear of crime research conducted in the Local Area Command (LAC), and this study builds on that 2003 project. The police therefore were able to provide crime data and logistical support for the data capture phase of this study. This made Kings Cross a more favourable site than other high crime and fear of crime areas. In addition, community consultation demonstrated that local residents were keen to cooperate with any fear of crime research (Darcy, 2003). This further made Kings Cross a suitable setting for the research, considering community cooperation can increase the chances of success of any strategies arising from the study findings.

Kings Cross is a high-density inner-city area that is undergoing rapid gentrification (Darcy, 2003; Dick, 2004). There are practical and policy implications of being able to map fear of crime in such areas. For example, the maps produced in this project, which show where and why people avoid areas, could help local Councils and developers re-design the environment. This in turn promotes the use of public space, while simultaneously combating fear. Many regions associated with crime or fear of crime have these characteristics, which mean it is likely that the methods developed in this

study could be applied to other similar areas where fear of crime is being targeted, further making Kings Cross an appropriate choice of research setting.

The City of Sydney Council (The City) maintains and controls development within the study site and the surrounding lands that make up the 'City East'. The City is currently producing their next City Plan, which will be influenced by the South Sydney Plan of 1997 and the Urban Design Study of 2006 (AJC, 2006). According to these earlier plans, The City aims to enhance the City East as an attractive place to work, live and recreate (AJC, 2006). In fulfilling this goal, The City aims to ensure people feel safe in public spaces (AJC, 2006; CoSC, 2006i). The City recognises that public spaces[116] in Kings Cross and its surrounds often create a sense of insecurity (CoSS, 1997a). The interest that The City has expressed in reducing public fear of crime, together with the fact that fear mapping provides a means to help them achieve this, further made Kings Cross an appropriate choice as the study site.

With a high density of people occupying the surrounding area, Kings Cross is a site where a large sample size can be gathered (Grennan, 10/5/2001). This was beneficial because a large sample size meant the data could be categorised into sub-groups. This diversity within the sample could subsequently be investigated. For example, the differences in the avoidance patterns adopted by men and women, or visitors and residents, could be studied. Furthermore, having resided in inner-Sydney, I am very familiar with the study area. This is a factor that is considered beneficial to researchers conducting surveys (Hamner & Saunders, 1984 in Halliday, 2000). All the above points illustrate that Kings Cross is not only and appropriate research setting, but one that is suitable for a pilot study. The next section describes the geographic location of Kings Cross.

4.2. Geographic location

Kings Cross is an inner-Sydney City district, officially located at 33°52'54'' south and 151 °13'34'' east (GDA94) (Refer to Figure 3 and Figure 4). Loosely, Kings Cross

[116] Particularly those that have been divided up into small areas and enclosed or filled with planting and low walls because they have a lack of visibility, poor lighting and limited opportunities for pedestrian movement (CoSS, 1997).

represents Sydney's adult entertainment district. It is surrounded by the suburbs of Darlinghurst, Wolloomooloo, Potts Point, Rushcutters Bay and Elizabeth Bay. Kings Cross Partnership Incorporated (2004) identifies seven distinct precincts that make up the Kings Cross district.

These precincts include:

- "The Strip" (discussed below)
- Darlinghurst Village, centering along Darlinghurst Road south of William Street, Darlinghurst
- East Sydney, Darlinghurst
- Bayswater Road, Potts Point
- Macleay Street, Potts Point
- Victoria Street, Potts Point and
- Woolloomooloo.

Darlinghurst Road or "The Strip", stretching over approximately 200 metres in Darlinghurst, is commonly considered to be the core precinct in the Kings Cross district. According to public record, The Strip is "situated at the junction of Victoria Street, Darlinghurst Road and William Street where the suburbs of Potts Point, Darlinghurst and Woolloomooloo meet" (NSW Government Gazette, 1996) (see Figure 5; and Plates 1 to 6 in Appendix C for photos of Darlinghurst Road). An area approximately a kilometre square, with Darlinghurst Road as its centre, was chosen as the specific site for this study. This area was chosen on the advice of the Kings Cross Police Commander. It includes the primary 'hot spots' of crime in the Local Area Command (LAC) and regions of low crime. This allowed a comparison between fear in high and low crime areas. The study site contains part of six City 'neighbourhoods' including Woolloomooloo, Kings Cross, Potts Point, The Bays, Darlinghurst West and Darlinghurst East. These neighbourhoods are referred to when the research results are discussed. An historical background to Kings Cross is provided in the next section, following three maps that show the geographic location of the study site.

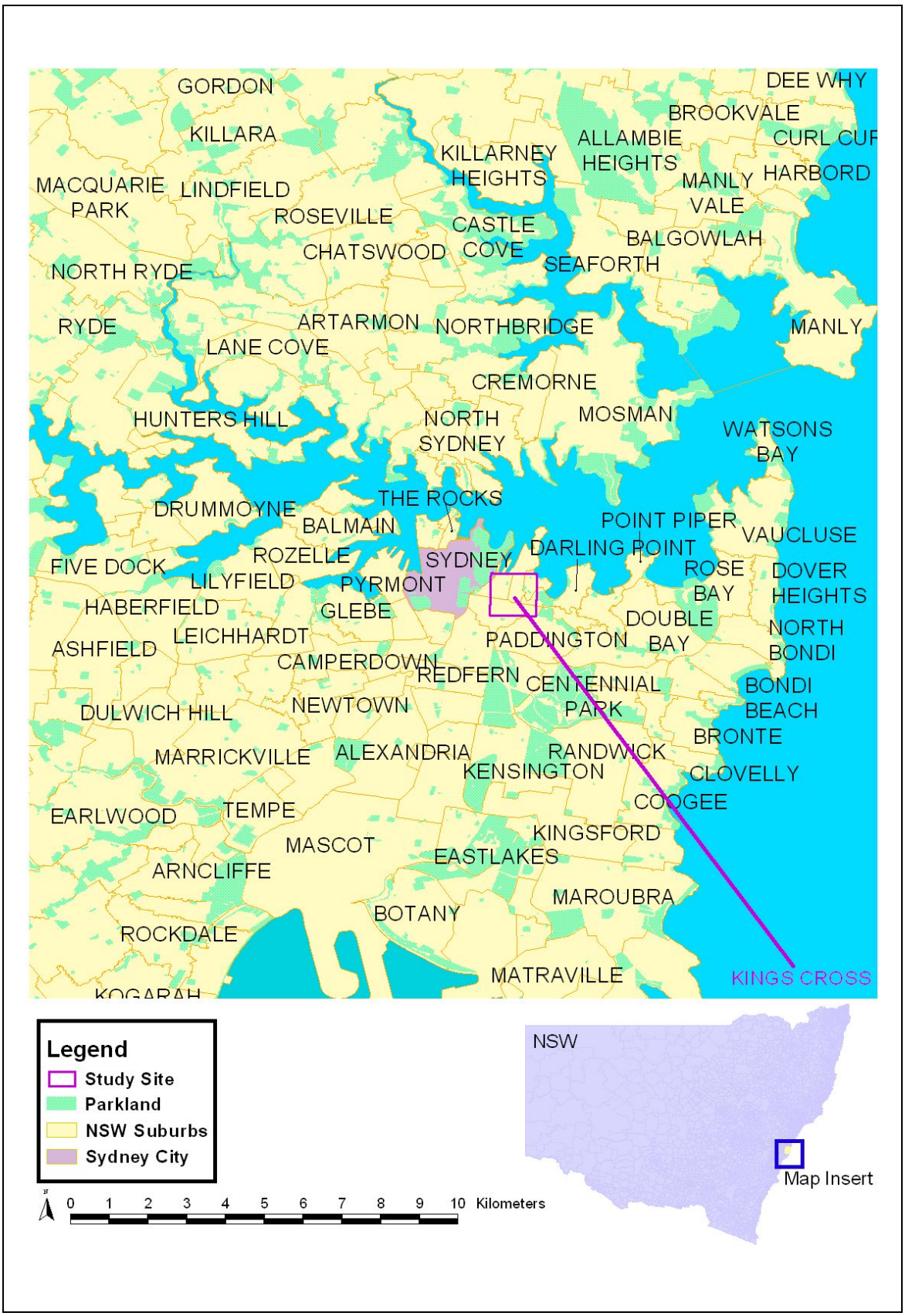


Figure 3. Map of Sydney, depicting Sydney's inner-east.

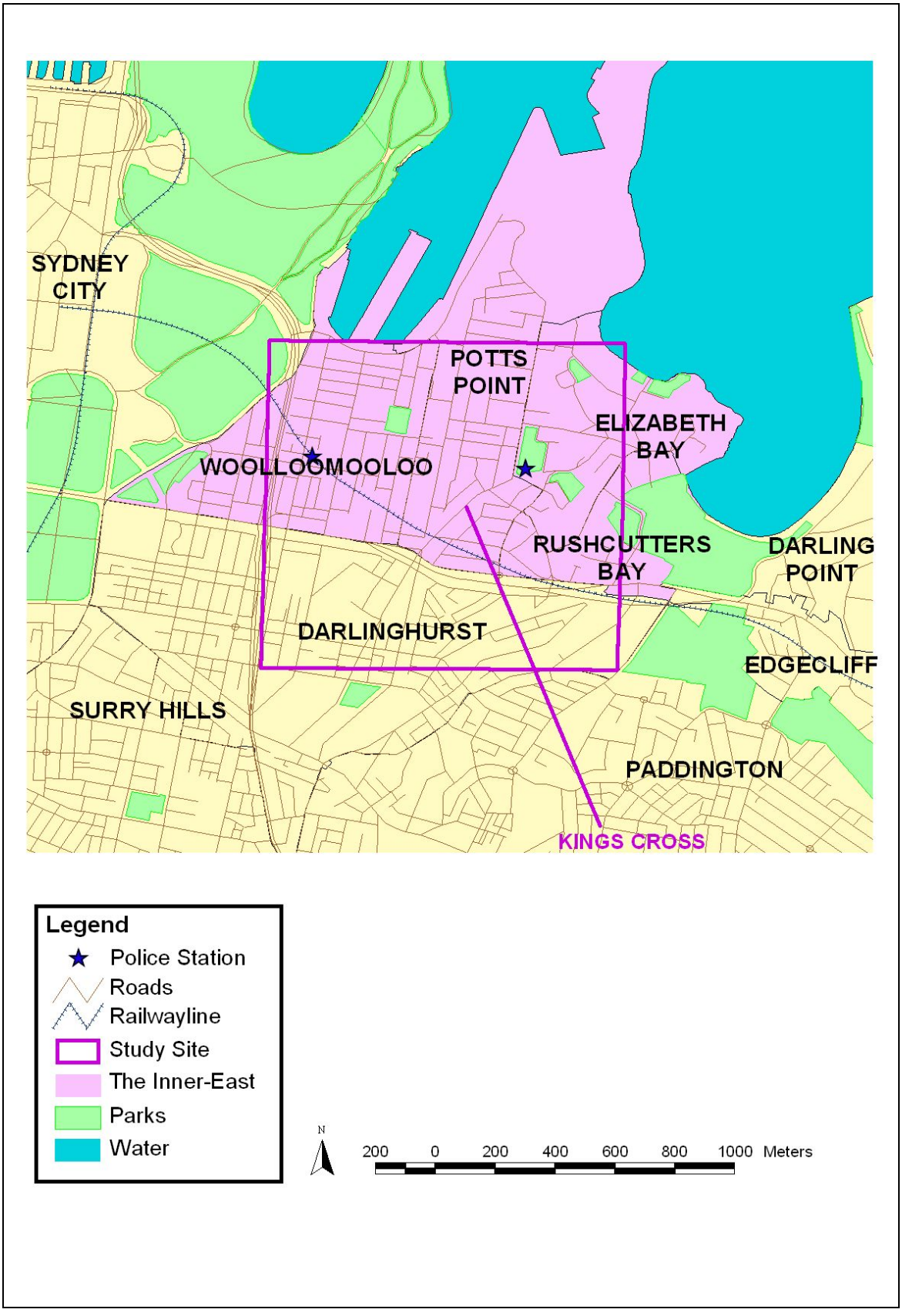


Figure 4. Map of Sydney's inner-east, depicting the Kings Cross study area.

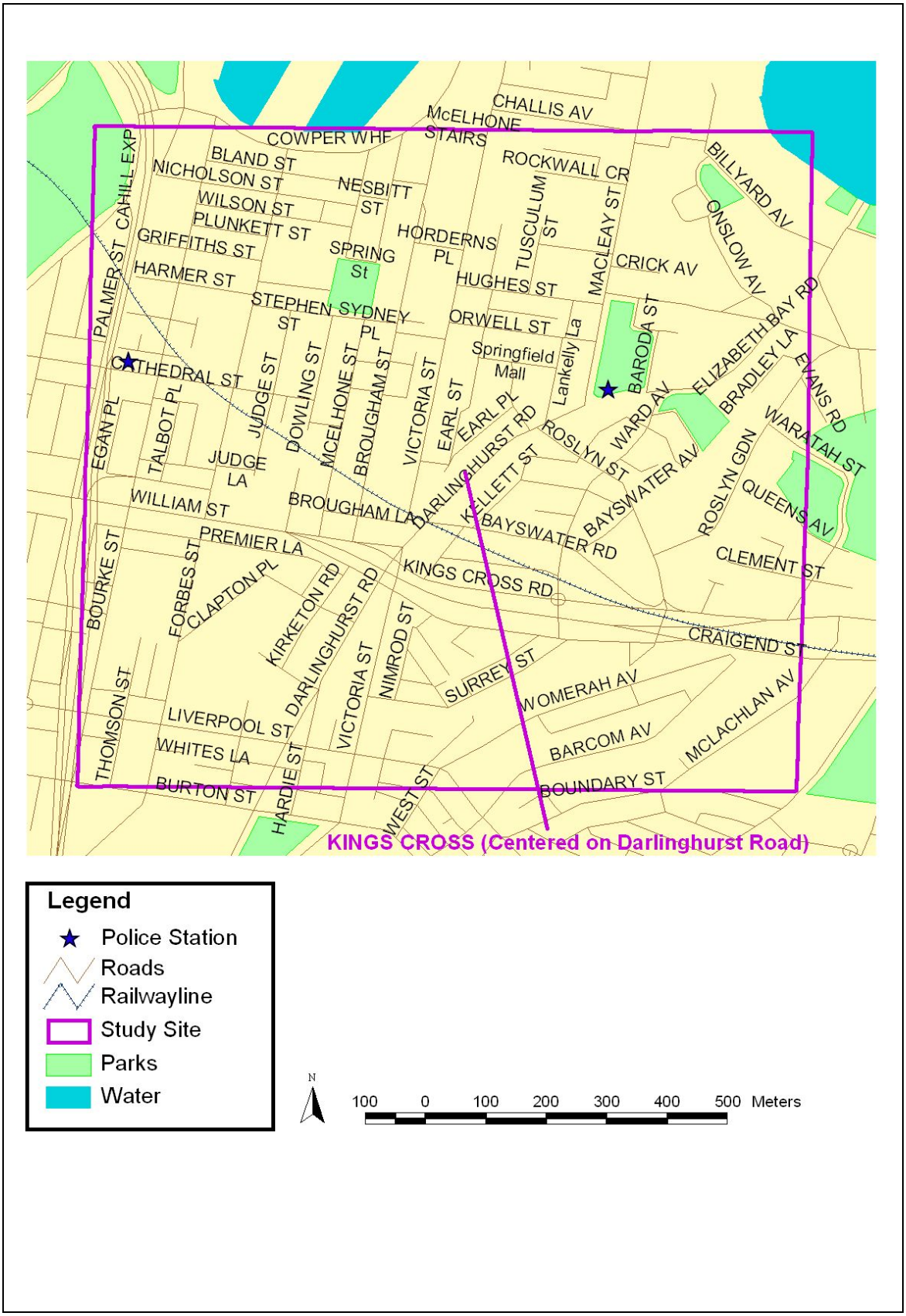


Figure 5. Street map of the Kings Cross study site.

4.3. Historical background

During the first half of the 19th century Queens Cross (now Kings Cross) was considered a wealthy area, being occupied by the community's upper class residents who lived on large estates and in mansions (Whitaker, 2002). The area was used predominately by the flour-milling industry and featured numerous windmills on open parkland (Butel & Thompson, 1984). The depression of the 1840s prompted residents to subdivide and sell off their land for the construction of terraces (Butel & Thompson, 1984; Whitaker, 2002). By the 1850s the area was renowned for its cheap housing, slum conditions and violence (Butel & Thompson, 1984). The area had become the home of the infamous gang, the 'Darlinghurst Push' (ESNA, 2002). Residences were subject to further subdivision in the 1870s following the imposition of heavy land taxes and by the 1880s terrace housing and ribbon development in the area became fashionable again (Butel & Thompson, 1984). During this decade the area saw a large influx of European migrants (Butel & Thompson, 1984; Whitaker, 2002; Lumby, 2005).

In 1905 Queens Cross was re-named Kings Cross and the region became popular for dining and entertainment (Whitaker, 2002). Gangs, mobsters, violence and shootings became common from 1916 (Butel & Thompson, 1984; Ellis, 1971). During the 1920s, prostitution was obvious and Darlinghurst Road gained its nametag as 'the dirty half mile' (Butel & Thompson, 1984; Ellis, 1971). Public outcry in the 1930s saw the gangs eradicated and the arrival of a Bohemian presence (Butel & Thompson, 1984). By this time, flats became prominent, as many terraces had deteriorated or were turned into boarding houses (Butel & Thompson, 1984; Lumby, 2005). An influx of refugees in the 1930s was closely followed by US servicemen, throughout World War II (Lumby, 2005). Butel and Thompson (1984) suggest that the "the growth of night clubs and strip clubs, black market trading and rampant prostitution" dated from World War II. Hence, World War II reportedly changed Kings Cross with the local residents being unhappy with corruption in the area and the presence of US servicemen (Ellis, 1971).

Cheap rents in the late 1940s encouraged an influx of more immigrants and again in the 1950s, Kings Cross entered a phase during which it was regarded as a sophisticated and cosmopolitan gathering place for diners and tourists (Ellis, 1971; ESNA, 2002). Kings Cross became famous for its "live theatre, good restaurants and

cafes and intellectual and artistic activities" (Lumby, 2005). More people immigrated from Europe and the Mediterranean regions under the Government's policies and settled in the area, adding to the culinary diversity (Lumby, 2005). In the late 1960s demand for terrace houses returned and prices in the area increased (Butel & Thompson, 1984).

Despite this, during the 1950s the area became known as a 'red light' district, with the growth of 'home' brothels (ESNA, 2002). Residents were complaining of harassment, assault and robbery and by 1967 a police station was built in Kings Cross (Ellis, 1971). In 1969, police made 11,624 arrests, an average of over 31 per day. These arrests included charges of assault, robbery, drunkenness, murder, prostitution, possession of drugs, vagrancy, obscene exposure, gaming and betting, receiving stolen goods and indecent language (Ellis, 1971). Ellis (1971) notes that a period of crime followed the "invasion" of American servicemen on leave from the Vietnam War from 1967 until 1970. In the early 1970s Kings Cross became the centre of heroin supply and use in Australia. By the late 1970s street prostitution was apparent (ESNA, 2002; Van Beek, 2004). This coincided with a decriminalisation of the offences loitering and soliciting for the purposes of prostitution in 1979 (ESNA, 2002). Public outcry in 1983 forced the amendment of the Prostitution Act to prohibit soliciting for prostitution in residential streets, however this law was not enforced (ESNA, 2002). The area was regarded by Executive Chief Superintendent, Ken Chapman, as being "volatile", with assaults "happening all over the place, both day and night" (Zadel, 30/3/1989).

Nevertheless, Kings Cross continued to be Sydney's premier tourist district into the 1970s and 1980s (Whitaker, 2002). Since the late 1990s, tourism in the area has declined and a majority of the hotels have been converted into apartments (Whitaker, 2002). Kings Cross's diverse history is evident in the heterogeneity of its current physical and demographic profile (Ellis, 1971). Streets contain buildings from different eras, and a diverse range of people from differing socio-demographic backgrounds occupy those buildings. This is illustrated in the next section on the demographic characteristics of the region. Economically, Kings Cross is still defined by its 24-hour adult entertainment services including strip clubs and associated brothels, licensed bars, cafes and restaurants, and backpacker accommodation (Jochelson, 1997). Travel organisations advertise Kings Cross as "the premier destination for visitors" (City of Sydney, 2005), featuring "a wild mixture of prostitution and crime, with stylish

restaurants and hotels" (Australian Explorer, 2005), and "more than two hundred of the city's finest restaurants, bars and cafes" (Tourism NSW, 2005).

4.4. Demographic characteristics

For statistical purposes, the Australian Bureau of Statistics (ABS) groups Kings Cross with Elizabeth Bay, Potts Point, Rushcutters Bay and Woolloomooloo. This area is known as Sydney's inner-east. The following statistics are sourced from the ABS 2001 Census.[117] The percentages and figures presented in this section are derived from raw census numbers and where relevant, calculations are provided in footnotes.

The population of the inner-east in 2001 was 15,506.[118] It is predicted that by 2008, Kings Cross will experience population growth to between 20,000 and 30,000 people (Knox, 19/3/2003). The inner-east is Australia's most densely populated area. Population density is more than twice that of the neighbouring suburbs of Edgecliff and Paddington, four times that of the eastern suburbs on average and more than 20 times that of the of Sydney's northern beaches (Grennan, 10/5/2001).

Slightly more males than females reside in Sydney's inner-east (Figure 6). This differs from the Sydney-wide population, of which 49% are male and 51% female.

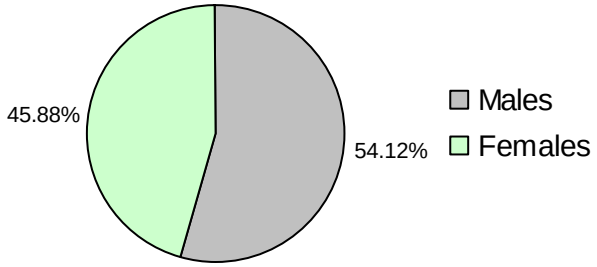


Figure 6. The inner-east demographic by sex[119]

[117] References: ABS, 2002b; ABS, 2002c.
[118] Total number of persons surveyed in the Census (20,018) minus overseas visitors (2,824) and visitors from Australia who reside in other statistical regions (1,688).
[119] Percentages calculated by adding the total number of males (8,317) and females (7,057) 'counted at home' with the total number of males (75) and females (57) 'visiting from the same statistical region' respectively. The total numbers of males and females residing in the statistical region were then each divided by the total number of residents (15,506).

The majority of the population is young or middle aged, with 28% aged between 18 and 29 years and 35% aged between 30 and 60 years. Only 14% of the population is under the age of 18 years, compared to 29% for all of Sydney. For both the inner-east and Sydney, 15% of the population is over the age of 60 years (Figure 7 and Figure 8).

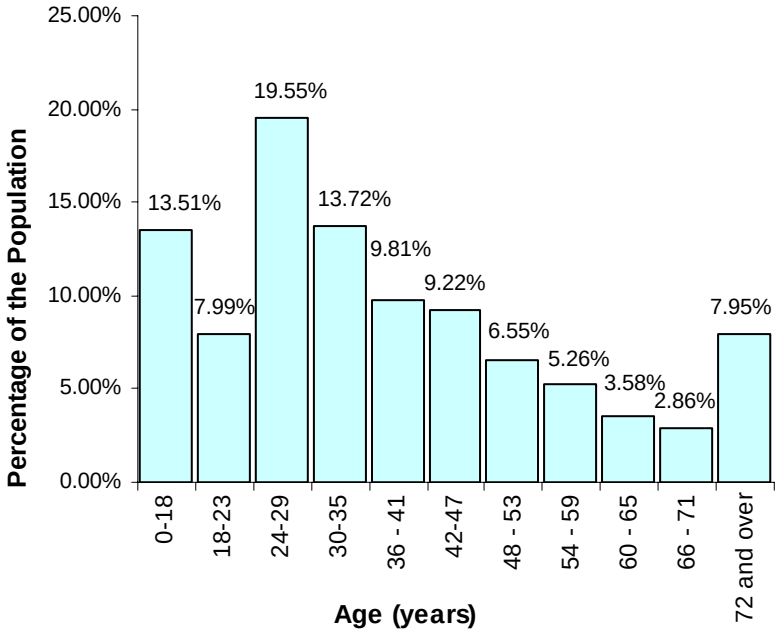
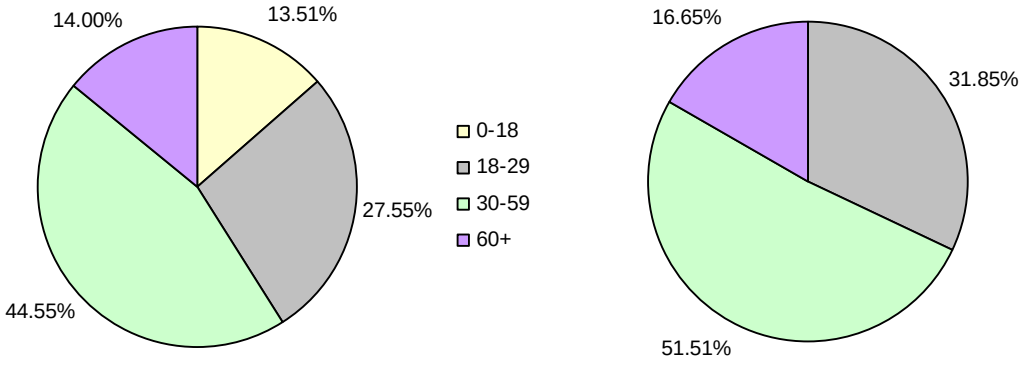


Figure 7. The inner-east demographic by age[120] : Original census groupings



Left: with 0-18 year olds

Right: without 0-18 year olds

Figure 8. The inner-east demographic by: Re-grouped into age categories reflected in this survey

[120] Percentages calculated by adding the total number of persons in each yearly age group to obtain the total number of persons in each appropriate age category; and then dividing that number by total number of residents (15,347).

Forty-eight percent of the residents in the Kings Cross region rent their place of residence and 27% are own their place of residence (Figure 9). This is very different to housing tenure for the general Sydney population, of which 25% are renters and 61% are owner-occupiers. Only 5% of Kings Cross and Sydney residents reside in government housing. Approximately 90%[121] of people live in a 1-2 person household.

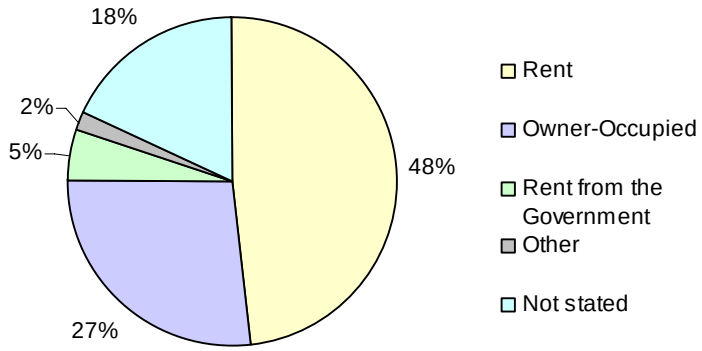


Figure 9. The inner-east demographic by housing tenure type[122]

Of the population over the age of five years, 66%[123] occupied a different address five years ago. This indicates that Kings Cross is in a state of change and confirms comments made in response to the 1996 census results, that the inner-east is one of the most transient populations in Sydney (Grennan, 10/5/2001).

[121] Percentage calculated by adding the total number of persons occupying a 1 person house (4,754) with the total number of person occupying a 2 person house (2,539) and then dividing that number by the total number of question respondents (7,971).
[122] Percentage calculated by adding the total number of persons in each tenure type sub-group to obtain the total number of person in each tenure type category and then dividing that number by the total number of question respondents (9,779).
[123] Percentage calculated by dividing the total number of persons who occupied a different address 5 years ago by the total number of residents and Australian visitors over the age of 5 years (13,461).

Of the 20,019 census respondents residing in the Kings Cross region on the night of the survey, 1,688 were visiting from other statistical regions in Australia and 2,824 were visiting from overseas nations. This means that approximately 23% of the census sample were visiting the Kings Cross region (Figure 10 and Figure 11). In comparison, only 1% of the population in Sydney on the night of the census were visiting from areas outside of Sydney. These statistics reflect the continuing popularity of the Kings Cross area for tourists. Of those people visiting the inner-east, 62% were visiting from overseas. This compares to 67% of the people visiting Sydney being from overseas.

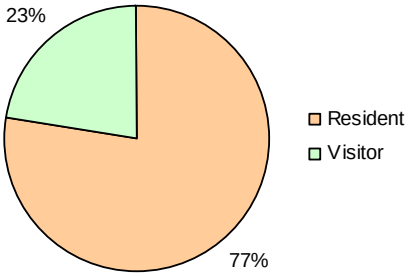


Figure 10. Residential status of people in the inner-east in census night

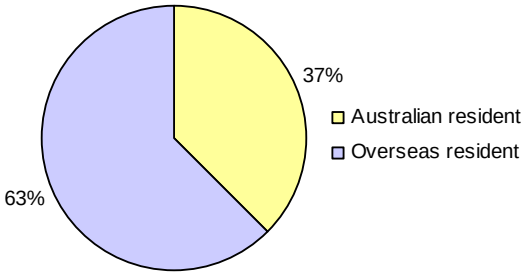


Figure 11. Place of birth of people visiting the inner-east of census night

One percent[124] of the residents in the Kings Cross region are of indigenous descent and 37%[125] were born overseas. This is similar to Sydney's population, with 1%[126] being of indigenous descent and 41%[127] being born overseas. Of those residents born overseas, 45% are from Europe, 45% from Asia and 18% from Oceania/Antarctica (Figure 12).

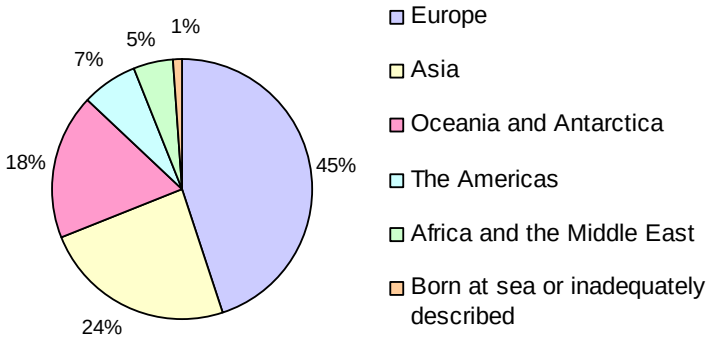
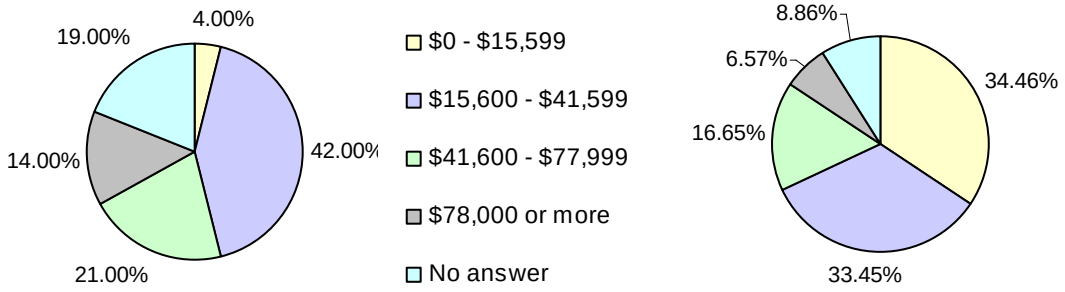


Figure 12. The inner-east demographic by birthplace, by continental region[128]

[124] Total Indigenous persons (185) divided by total number of residents (15,347).
[125] Persons born overseas (5,664) divided by total number of residents (15,347).
[126] Total Indigenous persons (31,174) divided by total number of residents (3,356,239).
[127] Persons born overseas (1,391,802) divided by total number of residents (3,356,239).
[128] Percentages calculated by adding the total number of persons in each yearly age group to obtain the total number of persons in each appropriate age category; and then dividing that number by total number of residents (15,347).

Of those employed residents: 4%[129] have a annual individual income of between $0 and $15,599; 42% have an annual income of between $16,000 and $41,599; 21% have an annual income of between $41,600 and $77,999; and 14% have an annual income of more than $78,000 (Figure 13). This is high in comparison to the Sydney population, of which 35% are in the lowest income bracket. The average weekly individual income in the inner-east is $700-$799 (Figure 14). An average weekly individual income of $700-$799 is high in comparison to the average for NSW ($300-$399) and Australia ($300-$399), indicating the local population is relatively wealthy.



Left: The inner-east Right: The Sydney

Figure 13. The inner-east and Sydney demographics by annual individual income

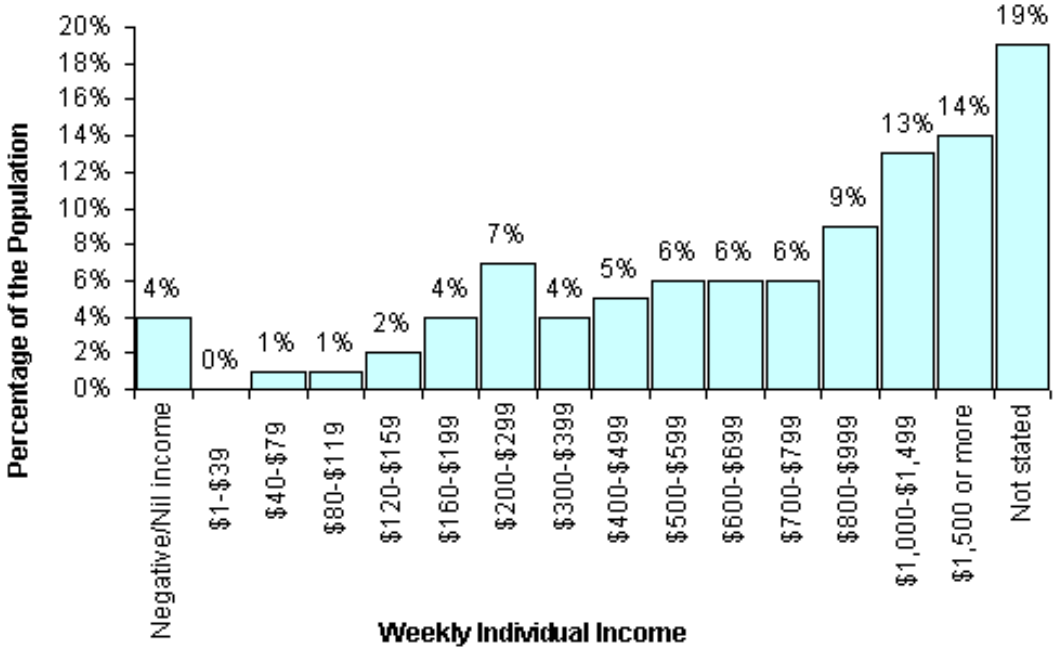


Figure 14. The inner-east demographic by weekly individual income[130]

[129] Percentages calculated by multiplying the total number of persons in each weekly income group by 52 to obtain the total number of persons in each corresponding annual income group; then adding the total number of person in each appropriate annual income category; and then dividing that number by the total number of question respondents minus the total number of visitors (15,937).

[130] Percentages calculated by dividing the total number of persons by the total number of question respondents minus the total number of visitors (15,937).

The Property and Business Services industry accounts for 24% of the workers residing in the inner-east. Eleven percent of workers are employed in Accommodation, Cafes and Restaurants (Figure 15). Property and Business Services is also the industry employing the largest proportion of the Sydney population, with 15%. This is followed by the Retail Trade and Manufacturing industries, with 13% and 12% respectively. Accommodation, Cafes and Restaurants accounts for only 5% of employment in Sydney.

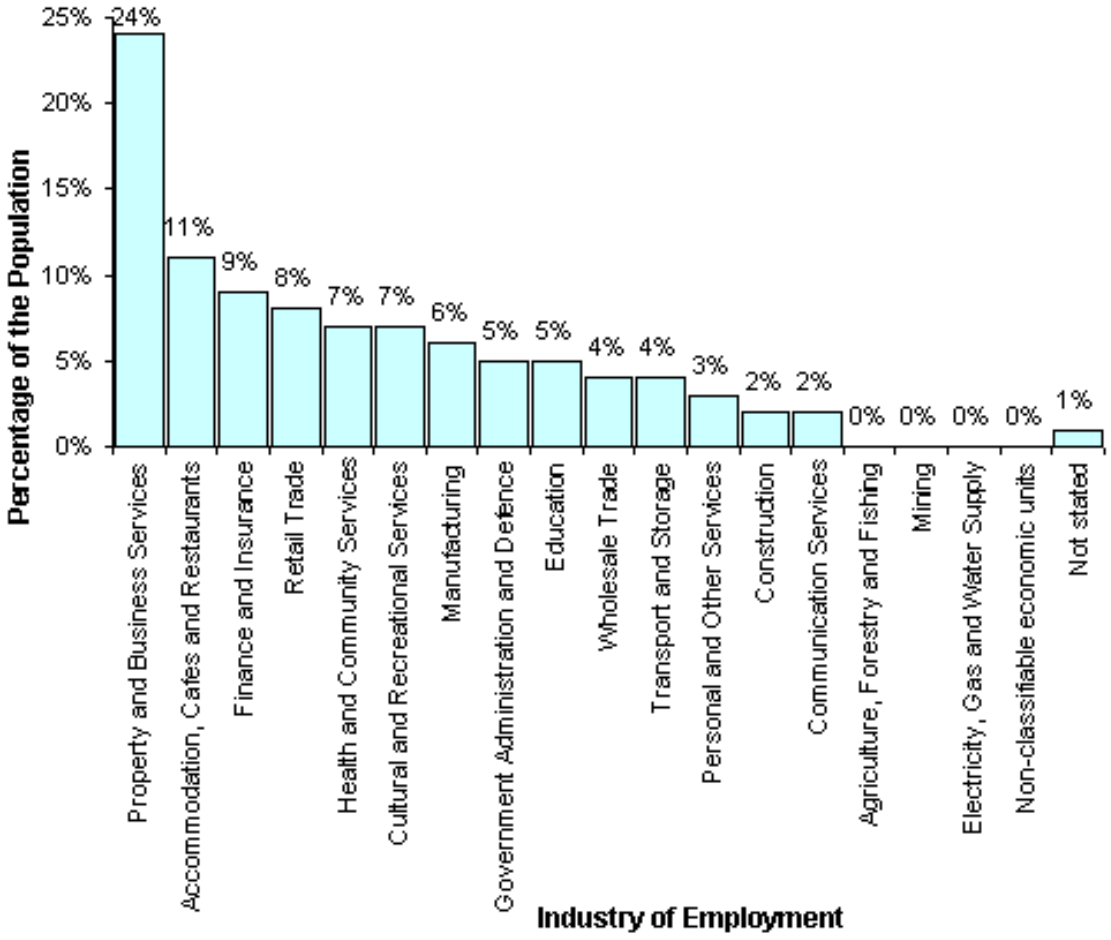


Figure 15. The inner-east demographic by employment industry[131]

[131] Percentage calculated by dividing the total number of persons employed in each industry by the total number of surveyed persons, excluding overseas visitors (9,516).

In the inner-east, public transport is the most popular method of travelling to work, comprising 29% of the population (Figure 16). Twenty-five percent of the residents walk to work and 26% drive a private vehicle to work. This suggests that people residing in the region will frequently need to be travelling though the area on foot. These statistics are much higher than those for Sydney, where only 14% catch public transport and 4% walk.

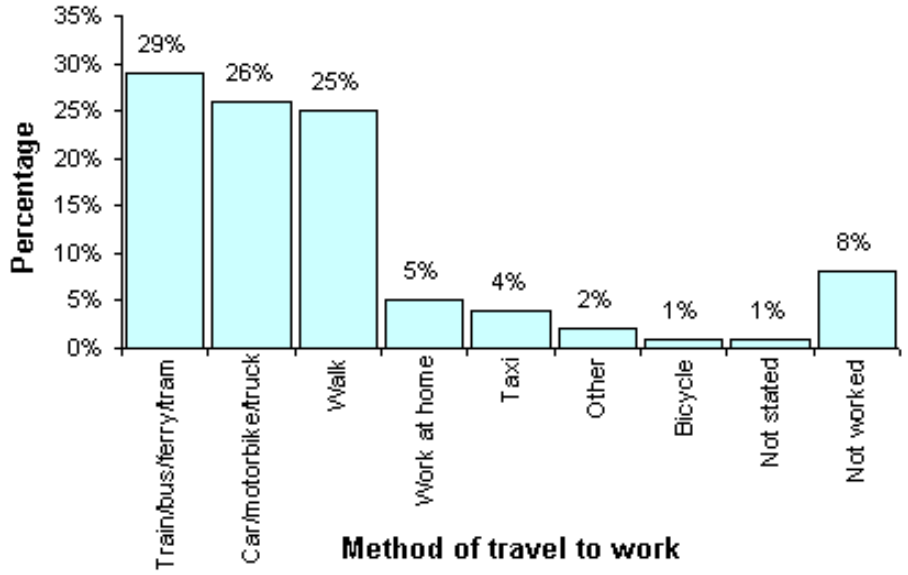


Figure 16. The inner-east demographic by method of travel to work[132]

[132] Percentage calculated by adding the total number of persons in each travel type sub-group to obtain the total number of person in each larger travel type category and then dividing that number by the total number of question respondents (9,529).

In summary, the inner-east has a very a high population density. Here, fear of crime has the potential to affect a large number of people in a relatively small area. In comparison to Sydney, more males than females live in the inner east and it could be hypothesised that fear is deterring women from residing in the area.[133] The population of the inner-east is older than Sydney's population and it could be supposed that altruistic fear of crime stops families from raising their children there (see Warr, 2000). Most of the Kings Cross population are renters. This is applicable to the study because housing tenure is linked to fear of crime, namely with the decreased ability renters have to 'target harden' their residence.[134] Kings Cross has a transient residential population and a high proportion of visiting tourists. Such transient areas are associated with increased fear of crime.[135] Similar to Sydney, Kings Cross has a large number overseas born residents. Areas with high sub-cultural diversity have also been associated with high fear of crime.[136] Kings Cross is a wealthy area, with a high proportion of residents working in the Accommodation, Cafes and Restaurants industry. Most residents walk or catch public transport to work. This is particularly relevant to this study, as fear of crime leading to avoidance reactions can potentially have a significant impact on many peoples' way of life. However, before discussing the presence of fear of crime in Kings Cross, the next section provides a description of crime in the area.

[133] Previous studies show women are more afraid of crime than men, see: Clarke & Lewis,. 1982; Gibson *et al*., 2002; Gilchrist *et al*., 1998; Gray & O'Connor, 1990; Hanson *et al*., 2000; Kanan & Pruit, 2002; LaGrange & Ferraro, 1989; Pain, 2000; Toseland, 1982).
[134] This is generally easier for owner-occupiers, who may consequently have lower fear of crime (See section 2.4.1.4.a of the Literature Review).
[135] See section 2.2.3.2 of the Literature Review.
[136] See section 2.2.3.2 of the Literature Review.

4.5. Crime

The NSW Bureau of Crime Statistics and Research (BOCSAR) has identified Kings Cross as an inner-Sydney hotspot of assault and robbery. Between July 1995 and June 1996, approximately one third of the assault recorded in inner-Sydney's outdoor locations occurred in Kings Cross (Jochelson, 1997). Table 1 shows the number and rate for each of the following offences: assault, robbery and 'other offences against the person' for the Kings Cross LAC between 1999 and 2004. To provide a comparison, Table 2 shows the number and rate of these offences for NSW between 2001 and 2004. For each year during this period, the rate of assault and 'other offences against the person' in The Kings Cross LAC was three times the rate of those offences NSW-wide. However, it is important to note that the crime trends in Kings Cross for these offences and other selected offences, like 'stealing' and 'break and enter', are all stable or decreasing for the period from 2000 to 2004. This is indicated in Table 3 on page 98.

BOCSAR statistics also show that out of the 80 police LACs in NSW, Kings Cross has consistently been ranked in the top 10 for assault, robbery and 'other offences against the person' from 2002 through to 2004 (see Table 4 on page 99). In 2003, the year prior to interviewing, Kings Cross was ranked 6th for assault, 4th for robbery and 6th for 'other offences against the person'. Comparatively, the statistics indicate Kings Cross is a hotspot for these specific crimes.

Currently, specific problems with crime in Kings Cross are largely alcohol and drug related, such as assault, the use of and dealing of illicit drugs, prostitution and vandalism; or are associated with socially disadvantaged youth who are being introduced into criminal enterprises (Darcy, 2005). Prostitution, homelessness, organised crime and anti-social behaviour are also considered the norm (Darcy, 2005).

Table 1. Number and rate[137] per 100,000 population of selected offences recorded by NSW police in the Kings Cross Local Area Command: 1999 to 2004

	1999		2000		2001		2002		2003		2004	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Assault	796	2786.5	874	3059.6	1063	3721.2	982	3437.7	947	3315.1	943	3301.1
Robbery total	326	1141.2	346	1211.2	492	1722.3	296	1036.2	289	1011.7	211	738.6
Robbery without a weapon	210	735.1	232	812.2	328	1148.2	206	721.1	193	675.6	153	535.6
Robbery with a firearm	15	52.5	9	31.5	17	59.5	7	24.5	8	28.0	8	28.0
Robbery with a weapon not firearm	101	353.6	105	367.6	147	514.6	83	290.6	88	308.1	50	175.0
Other offences against the person	9	31.5	12	42.0	14	49.0	14	49.0	16	56.0	15	52.5

(Source: NSW Bureau of Crime Statistics and Research, ref: tm05-3505)

Table 2. Number and rate per 100,000 population of selected offences recorded by NSW police in NSW: 2001 to 2004

	1999		2000		2001		2002		2003		2004	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Assault	-	-	-	-	69165	1051.9	72279	1089.5	72419	1083.8	70122	1041.7
Robbery total	-	-	-	-	-	-	-	-	-	-	-	-
Robbery without a weapon	-	-	-	-	8055	122.5	6614	99.7	6270	93.8	4973	73.9
Robbery with a firearm	-	-	-	-	992	15.1	805	12.1	793	11.9	666	9.9
Robbery with a weapon not firearm	-	-	-	-	5229	79.5	3486	52.5	2971	44.5	2609	38.8
Other offences against the person	-	-	-	-	994	15.1	1130	17.0	1270	19.0	1414	21.0

(Source: NSW Bureau of Crime Statistics and Research,
http://www.lawlink.nsw.gov.au/lawlink/bocsar/ll_bocsar.nsf/vwFiles/NewSouthWales.xls/$file/NewSouthWales.xls)

[137] Incident rates are based on Local Area Command population figures from 2001

Table 3. Trends in selected offences for the Kings Cross Local Area Command: 2003 to 2004 & 2000 to 2004

Offence category	Annual percentage change 2003 to 2004	Average annual percentage change 2000 to 2004
Assault	Stable	Stable
Sexual assault	Stable	Stable
Indecent assault, act of indecency and other sexual offences	Stable	Stable
Robbery without a weapon	Down by 20.7%	Down by 9.9%
Robbery with a weapon not a firearm	Stable	Down by 16.9%
Break and enter - dwelling	Down by 31.7%	Down by 13.6%
Break and enter - non-dwelling	Stable	Down by 13.9%
Motor vehicle theft	Stable	Down by 8.7%
Steal from motor vehicle	Down by 16.0%	Down by 14.0%
Steal from retail store	Stable	Up by 10.8%
Steal from dwelling	Stable	Down by 4.1%
Steal from person	Down by 22.0%	Not calculated
Malicious damage to property	Stable	Stable

(Source: NSW Bureau of Crime Statistics and Research, ref: tm05-3505)

Table 4. Number, rate[138] per 100,000 population and ranking of selected criminal incidents recorded by NSW police: 2002 to 2004

Assault	2002			2003			2004		
Local Area Command	**number**	**rate**	**ranking**	**number**	**rate**	**ranking**	**number**	**rate**	**ranking**
Castlereagh	668	5134.9	1	647	4973.5	2	752	5780.6	1
City Central	1445	4988.6	2	1606	5544.4	1	1460	5040.4	2
The Rocks	601	4861.3	3	598	4837.0	3	602	4869.4	3
Kings Cross	982	3437.7	6	947	3315.1	6	943	3301.1	6

Robbery	2002			2003			2004		
Local Area Command	**number**	**rate**	**ranking**	**number**	**rate**	**ranking**	**number**	**rate**	**ranking**
Redfern	614	1763.4	2	559	1605.4	2	543	1559.4	1
City Central	1445	4988.6	2	1606	5544.4	1	1460	5040.4	2
Surry Hills	270	1172.5	4	279	1211.6	3	267	1159.5	3
Kings Cross	296	1036.2	5	289	1011.7	4	211	738.6	4

Other offences against the person	2002			2003			2004		
Local Area Command	**number**	**rate**	**ranking**	**number**	**rate**	**ranking**	**number**	**rate**	**ranking**
The Rocks	9	72.8	2	9	72.8	2	15	121.3	1
City Central	22	76.0	1	14	48.3	8	31	107.0	2
Orana	25	43.7	7	36	62.9	3	44	76.9	3
Kings Cross	14	49.0	5	16	56.0	6	15	52.5	9

(Data Source: NSW Bureau of Crime Statistics and Research, ref: sew05-3525)

[138] Incident rates are based on Local Area Command population figures from 2001

While useful for the analysis of crime in settings with a stable or closed population with few transients or visitors, the statistics presented in the previous tables must be viewed with caution in an area such as Kings Cross. This is due to the high number of people passing through. For example, the rates are calculated using the residential population of Kings Cross. This population does not reflect the large number of people visiting the area during the day and night, as discussed earlier in the demographic characteristics section of this chapter. Therefore the crime rates appear higher than if these extra populations are taken into account. Nevertheless, they are useful to illustrate the high number of criminal incidents occurring in the Kings Cross.

Of all criminal offence categories, robbery and assault are the most pertinent to this study. This is discussed in the Methods chapter. Figure 17 shows the recorded sites of robbery and assault that occurred in the six-month period prior to interviewing for this study (October 2003 to April 2004).[139] Robbery was reported predominately along Darlinghurst Road and William Street. Liverpool and Victoria Streets also experienced a few incidents of robbery. The occurrence of assault was more widespread than robbery. Assault was most common along Darlinghurst Road, Victoria Street, Bayswater Road, Kellett Street, Roslyn Street, Ward Avenue and Liverpool Street. However, incidents are reported sporadically throughout Wolloomooloo. Other streets with multiple sites of assault include Forbes Street, Dowling Street and Kings Cross Road. Overall, the incidence of crime is densest along Darlinghurst Road, particularly between Fitzroy Gardens and Bayswater Road. The study site north of William Street has comparatively more crime than the southern region. In the area south of William Street, crime essentially occurs west of Victoria Street, with the south-eastern quadrant of the study site being relatively crime free.

[139] NSW Police supplied crime data indicating where cases of robbery and assault took place in the six-month period prior to interviewing (October 2003 to April 2004). This data was transferred from a text document into an Excel tabled and saved as a database file (format 4) so that it could be incorporated into the GIS. A point shapefile was created using the 'create feature class – from XY table' command in ArcCatalogue and displayed in ArcMap.

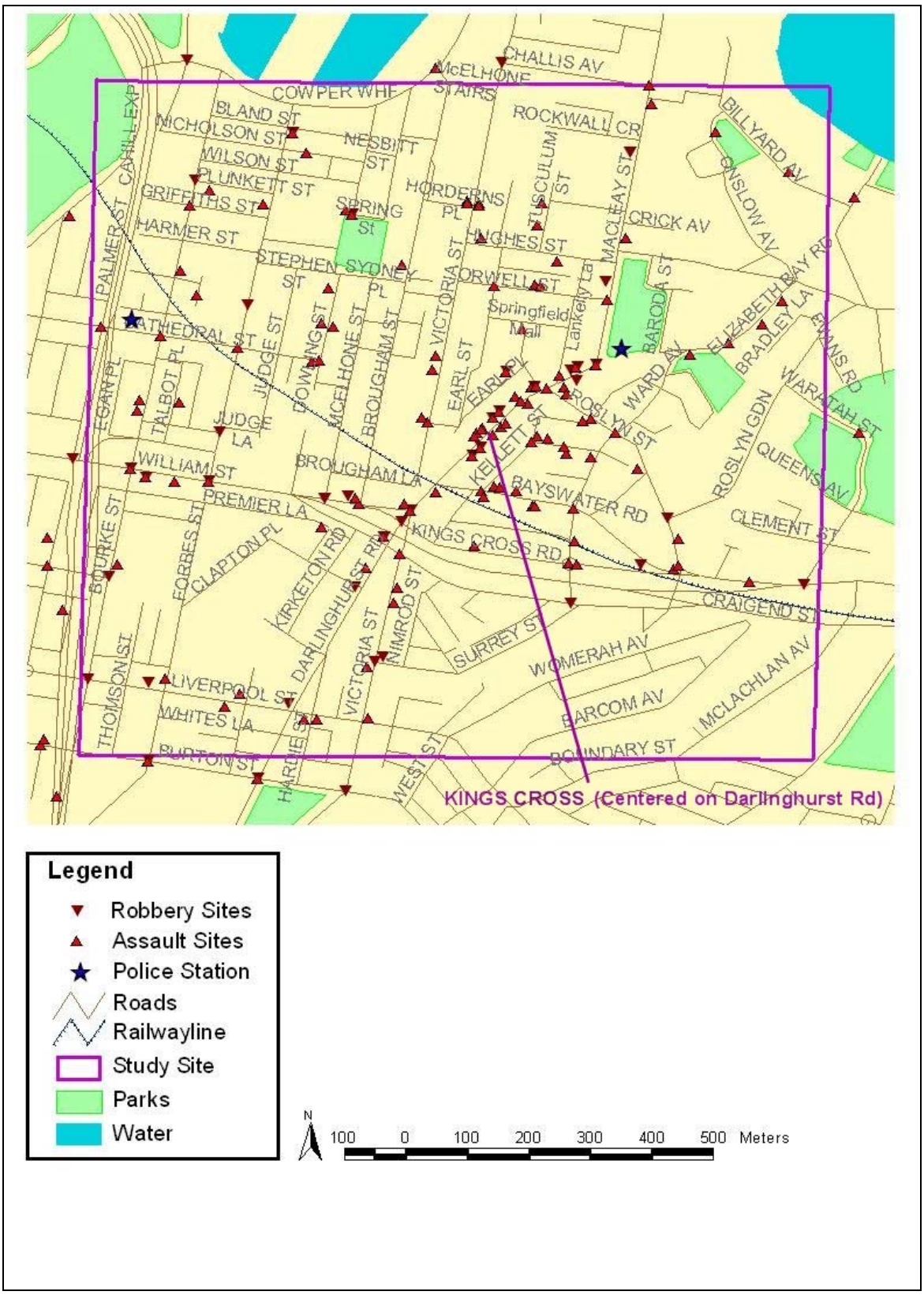


Figure 17. Sites of robbery and assault in the six-month period prior to interviewing (October 2003 to April 2004).

4.6. Fear of crime

In addition to crime, fear of crime is recognised as a problem in the study site. Tulloch *et al.*'s (1998) An Australia-wide fear of crime study identified Kings Cross as having a reputation for crime and fear of crime.[140] Many of their respondents acknowledged that they have never been to Kings Cross and were fearful of crime due to presumed crime levels and police corruption. In line with this reputation, many travel organisations advise visitors to be careful in Kings Cross (Sydney Online, 2005; Travel Online Australia, 2005).[141] Nevertheless, it is also recognised as a place of excitement and pleasure.

In 2003, the Kings Cross Police conducted a fear of crime survey and mapping project using perceived risk-based measurement questions. Of 603 respondents, 62% stated they felt unsafe in the Kings Cross Local Area Command (Darcy, 2005). Due to methodological inconsistency, it is difficult to compare this level of fear with those evident in other regions of Australia.[142] In 2004, I conducted a fear of crime survey using crime-specific avoidance-based measurement questions and produced a number of preliminary avoidance maps. When comparing areas of fear with sites of robbery and assault, I found that there were areas of the study site where crime and fear of crime appear to coincide. However, there were regions of discrepancy, where levels of fear appeared with lower or higher than the occurrence of crime would justify when using those spatially congruent areas as a point of reference (Burgess, 2004). This mismatch is largely attributed to the presence of environmental cues that trigger fear of crime, which were not examined in this initial study (Burgess, 2004). Darcy's survey found that *junkies/homeless people* were the top response for triggering those respondents to

[140] For example, their Tasmanian survey respondents most commonly mentioned Kings Cross as the most dangerous place in Australia. However, even their Sydney respondents mentioned Kings Cross as a dangerous suburb (Tulloch *et al.,* 1998).

[141] For example, one organization warrants visitors to be careful "especially at night, as people do get mugged here… spruikers outside nightclubs: they can be intimidating and aggressive" (Sydney Online, 2005). In contrast others comment that "it is well policed and there's rarely more trouble than a few drunks having a fight." (Travel Online Australia, 2005).

[142] The ABS's 2006 General Social Survey found that less than half (48%) of people reported feeling *safe* or *very safe* walking alone in their local area at night (ABS, 2006). The ABS's 2005 Crime and Safety Survey found that 4% (day) and 8% (night) of respondents felt unsafe or very unsafe when at *home* alone during the day and night respectively (ABS, 2005). The ABS's 2002 Crime and Safety Survey found that 4% (day) and 10% (night) of respondents felt unsafe or very unsafe when at *home* alone during the day and night respectively (ABS, 2002a).

feel unsafe (see Table 5). Both of these studies will be discussed more throughout this thesis.

Table 5. Top ten responses accounting for triggering respondents to feel unsafe.

Reason for feeling unsafe	**Percentages**
Junkies/Homeless	18%
Prostitutes	13%
Spruikers/Intoxicated persons	8%
Dark Laneways	7%
Vulnerabilities	6%
Intimidation	6%
Lighting	5%
Lack of Cleanliness	5%
Laneways	4%
Loitering	4%

(Source: Darcy, 2003)

4.7. Summary of the research setting

Kings Cross was chosen as a suitable setting for a fear of crime study. The geographic location of Kings Cross and population density means a large sample can be easily gathered. The area demographic, which is similar to many other inner-city locales where the study could be replicated, makes Kings Cross an ideal test region. The historical background and recent climate of crime and fear of crime in Kings Cross also meant Kings Cross was an appropriate site. Furthermore, there was early interest from the police, community and government in the area. This interest may increase the likelihood that any informative research findings could be used for fear of crime prevention through policy, planning and practice. The next methods chapter, on the survey design and implementation, will outline the actual methods undertaken in this study to obtain information on fear of crime in Kings Cross.

5. Methods: Survey design and implementation

This chapter outlines the methods used to acquire the research data. It covers the survey design, the survey content and the interviewing procedure.

5.1. The survey

While the survey used in the data collection process is presented in Figures 127a to 127e in Appendix A, its design and content is discussed in this section of the methods chapter. A number of factors were considered when constructing the survey used to collect the data required for this research project. These factors included the design and layout of the survey, the topic, the wording and the order of the questions.

5.1.1. Survey design and layout

The survey consisted of a short questionnaire and then a mapping section, whereby respondents mapped specific areas of the study area that they avoided. It was thought that the mapping section could confuse the respondents with an unfamiliar type of questioning and therefore deter them from finishing the survey. Therefore, the more commonly used questionnaire section was presented before the mapping section. In addition, the order of the questions, moving from the general to specific, was selected to slowly introduce the respondent to the topic of study. This is recommended in Oppenheim (1996), Punch (1998) and Robsen (1993).

A series of closed-ended questions was chosen for the questionnaire. Closed-ended questions act to force people's responses into predetermined answers that may or may not be appropriate. However, they have a number of positive features outweighing the negative features (Oppenheim, 1996; Robson, 1996). In particular, they leave less room for misinterpretation, are easier and quicker to answer, require no writing, and are easier to analyse statistically (Oppenheim, 1996; Robson, 1996).

The time taken to complete the survey was an important factor in its design. It was suggested that people in Kings Cross would not give more than five minutes of their time to participate in a survey (Darcy, pers com, 17/3/04). Thus, after a pilot study testing the survey's length and general readability, the questionnaire was limited to 10 questions. This pilot study, of approximately 10 survey respondents, was undertaken on the Australian National University campus. The maps of Kings Cross were substituted with maps of central Canberra.

Care was taken when writing the questions so that they did not contain 'agree or disagree' statements, double negatives, acronyms, abbreviations or technical jargon (Oppenheim, 1996). Questions were also kept short and specific to ensure ease of understanding so there was less susceptibility to a wider range of interpretations (Oppenheim, 1996; Robson, 1996). In addition, attention was paid to specific words notorious for their ambiguity, for example 'you' (Oppenheim, 1996). In this instance it was made clear to the survey respondents that this term referred to them only.

The survey was titled 'community safety survey' rather than 'fear of crime survey'. It was anticipated that people, particularly men, would not be interested in participating in a project researching fear. This is because fear is often associated with weakness, a personal characteristic that people commonly do not like to reveal (Clemente & Kleiman, 1977; Smith & Torstensson, 1997). The use of 'fear' in the title may also have influenced the respondents' reactions to the survey and generate respondent bias. In addition, the fear of crime is a very political topic (see Cameron, 7/2/2002; Cornell, 13/7/2002; Devine, 8/11/2001; Horin, 27/4/1994; Totaro, 24/10/1988). Thus, projects focusing on the fear of crime can receive a large amount of media attention, as did the 2003 fear mapping project (Darcy, pers com, 17/3/04). In an effort to eliminate potentially detrimental or distracting coverage, a title was chosen that was apolitical and less provocative, whilst still promoting public interest.

5.1.2. Survey questions

This section presents and discusses the survey content.

5.1.2.1. Questionnaire section: Socio-demographic questions

This section presents the questionnaire section of the survey that was used to obtain information about the sample population. The survey questions are discussed with the socio-demographic groups they are designed to target. The questions are adapted from those in the survey used by Doran and Lees (2003).

5.1.2.1.a. Questions One and Two: Sex and Age

Borooah and Carcach (1997) state that "sex and age are considered an integral part of any model of fear of crime". These two factors are considered as the most influential components in accounting for the fear of crime. For this reason, Questions 1 and 2 were included in the survey. The age categories listed in Question 2 were later grouped as '18-29', '30-59' and '60+'. These three groups allowed comparison of ABS census statistics and findings presented in other fear of crime studies.

1. What sex are you?

☐ Male ☐ Female

2. How old are you?

☐ 18-23	☐ 42-47	☐ 66-71
☐ 24-29	☐ 48-53	☐ over 72
☐ 30-35	☐ 54-59	
☐ 36-41	☐ 60-65	

5.1.2.1.b. Question Three: Housing tenure type

In comparison to other non-owner occupiers, studies have suggested that people who are homeless or living in government housing are more fearful of crime and that owner-occupiers are less fearful of crime (Borooah & Carcach, 1997; Gibson *et al*., 2002; Pain, 2000). Question 3 is relevant to the research setting because within Kings Cross there is a great diversity of residential status, as indicated in the Research Setting. The response categories were chosen to reflect housing tenure types in the area. Non-owner occupiers refer to those people renting in the private sector or staying with family or friends. 'Type of housing', rather than 'tenure type', was used in the question to improve readability.

3. What type of housing do you live in?
   - ☐ Renting from a government housing commission
   - ☐ Non owner-occupier
   - ☐ Owner-occupier
   - ☐ Staying in backpacker accommodation
   - ☐ Lodging in a community shelter

5.1.2.1.c. Question Four: Residential status

The more familiar a person is with an environment, the more their assessment of safety is increased (Ferraro & LaGrange, 2000; Gray & O'Connor, 1990; Gilchrist *et al*., 1998). Similarly, unknown environments are more likely to be evaluated by people as dangerous places and provoke fear of crime (Ferraro & LaGrange, 2000). In accordance with these theories, the Commander of Kings Cross Police hypothesised that residents of the area, particularly longer-term residents, are less fearful than visitors (Darcy, pers com, 5/4/04). However, studies have shown that tourists from overseas nations have lower levels of fear of crime (Brunt *et al*., 2000; Mawby *et al*., 2000). The following question was included to test these assumptions. Due to the ambiguous nomenclature of Kings Cross (discussed in section 4.2), residents were defined as those people with the postcode of the Kings Cross-statistical region, 2011. Also, people staying in backpacker or temporary accommodation were regarded as residents if they had worked in the area over 6 months and were seeking permanent accommodation.

4. Are you a resident of Kings Cross?

☐ No → → → → What is your postcode? .....….....
(Australian residents)

What is your home country?.....
(non-Australian residents)

☐ Yes → → → → How long have you been living in Kings Cross?

☐ Less than 1 year ☐ 3 – 5 years

☐ 1 – 2 years ☐ more than 5 years

5.1.2.1.d. Question Five: Experience of victimisation

There is controversy over whether people's experiences of victimisation exacerbate or reduce their fear of crime (Carcach & Mukherjee, 1999). Question 5 was included in the survey in order to examine the effect of victimisation on people's fear of crime. The majority of studies investigating this link focus on the 12 months prior to interview (see Akers *et al., 1987*; Borooah & Carcach, 1997; Gray & O'Connor, 1990). This time period was chosen because:

- it allows comparison of results to be made with previous studies;
- it is recommended that surveys do not over tax the respondents' memories;
- people are known to confuse the timing of events occurring over 12 months ago; and
- it is often assumed that victimisations occurring more than 12 months before the interview have little effect on fear of crime by the time of the interview (Block, 2000; Garofalo, 1979; Oppenheim, 1996).

Ferraro (2000) suggests that the type of victimisation affects the extent to which the experience impacts the respondents' fear of crime. Thus, the survey respondents were asked to clarify the type of crime experienced. The crime categories were chosen in accordance with Borooah and Carcach (1997).

5. Have you been a victim of any of the following crimes in the past 12 months?
   - ☐ Deliberate use of a weapon
   - ☐ Attack or assault
   - ☐ Threats of force or violence
   - ☐ Theft and attempted theft
   - ☐ Deliberate damage to property or tampering by vandals or thieves

5.1.2.1.e. Question Six: Reporting crime

When considering crime rates in relation to the higher-than-expected fear of crime levels, Painter (1996) acknowledges that crimes go unreported and that high fear of crime may be justified. This knowledge is important for studies examining the mismatch between the incidence of, and fear of, crime. The following question was therefore included in the survey to determine what proportion of crime goes unreported in Kings Cross.

6. If you have been a victim of crime in Kings Cross, did you report it to the Police?

☐ Yes ☐ No

5.1.2.1.f. Question Seven: Social integration

Individuals who believe social control, trust or cohesion is present in their community report feeling less fearful of crime (Box *et al.*, 1988: 343; Katz *et al*., 2003; Sampson & Raudenbush, 1999). As the population demographic in Kings Cross is continually changing, it could be assumed that people residing in, or visiting, the area have less confidence in the level of mutual support they can expect from their neighbours in a crime-related emergency (Darcy, 2003; Dick, 2004). Question 7 was included in the survey to indicate whether the respondent thought this informal social control was present in Kings Cross. It was adapted from Covington and Taylor's (1991) 'community cohesion' question, involving spray painting, to better suit Kings Cross.

7. Suppose you saw someone in Kings Cross being assaulted or robbed. Do you think you or any of your neighbours would call the police?

☐ Yes ☐ No

5.1.2.1.g. Question Eight: Confidence in the police

Earlier research by Garofalo (1979) demonstrates that confidence in the police is related to fear of crime. For example, if people believe the police are efficient and effective when responding to calls and apprehending criminals, then they are less likely to fear crime (Baker *et al.*, 1982; Krahn & Kennedy, 1985 in Box *et al.*, 1988). This is also particularly relevant in the chosen research setting, as the Kings Cross police have had an unfavourable reputation following accusations and evidence of corruption (Wood, 1997). With this in mind, the following question was added to the survey.

8. How confident would you be about obtaining police assistance in a crime-related emergency?

   ☐ Very confident

   ☐ Quite confident

   ☐ Don't know

   ☐ Not very confident

   ☐ Not confident at all

5.1.2.1.h. Question Nine: Fearfulness using a global measurement approach

As was indicated in section 2.4.1.2, surveys frequently measure fear of crime by asking a version of the global question, "have you felt fearful or afraid when walking alone in your neighbourhood" (Ditton, 2000; Panatzis, 2000). The presence of Question 9 in the survey allows for comparison between results from this study and results from previous studies. Furthermore, it provided an important variable allowing global measures of fear of crime to be compared with crime-specific avoidance-based questions.

9. Have you ever felt fearful or afraid when walking alone in Kings Cross?

   ☐ Yes ☐ No

5.1.2.1.i. Question Ten: Income

Greater levels of fear of crime have been associated with both lower and higher income earners. Previous studies have shown that people in lower economic groups are likely to be more vulnerable and afraid of crime. They are less able to protect themselves or their property and avoid situations that produce anxiety (Hale, 1996 in Borooah & Carcach, 1997; Evans & Fletcher, 2000; Pantazis, 2000). Similarly, studies have shown that high-income groups are less fearful of crime (Akers *et al.*, 1987; Hanson *et al*., 2000). In contrast, it is the perception of the Kings Cross police Commander that more affluent persons are more fearful of crime, possibly because affluent people believe they are a more attractive target and have more to lose in the event of an attack (Darcy, pers com, 17/3/04). A question regarding the respondents' annual income was included in the survey. The four categories are an amalgamation of those used in the 1996 census and were chosen to represent individuals in the lower, lower-middle, average and upper income groups. This question was placed at the end of the survey because the respondents may have considered it as rude or intrusive. If so, this could alter the respondents' attitude when answering questions that followed, therefore creating bias, or prompt them to decline participating. This question was omitted from other studies because of large numbers of refusals or 'don't knows' (Box *et al.*, 1988; Oppenheim, 1996)

10. What is your annual income?

- ☐ $0 - $15,599
- ☐ $15,600 - $41,599
- ☐ $41,600 - $77,999
- ☐ $78,000 or more

5.1.2.2. Mapping section: Crime-specific avoidance-based questions

This section outlines the design of the cognitive mapping procedure used to investigate avoidance behaviour. While this procedure is based on Doran and Lees' survey (2003), new innovations make the spatial data acquisition process used in this project relatively unique compared to other fear mapping studies.

5.1.2.2.a. Question Eleven (Part A): Occurrence of avoidance

For Question 11, respondents were provided with a map of the Kings Cross study area. They were asked if they avoided any areas because they were afraid of being *robbed, beaten or attacked*, firstly during the day and secondly during night. This question specifically refers to people's fear of personal crime and is therefore not conceptually vague. These crimes were chosen because they are particularly pertinent to Kings Cross, as acknowledged in the research setting methods chapter. If the respondent answered positively, they were then asked to illustrate on the map those areas they avoided because of such a fear (see Figure 18).

Figure 18. The UBD map used in the survey for Question 11, Parts A and B (reduced in size and quality). The production of this map is outlined in section 6.2.1.

5.1.2.2.b. Question Eleven (Part B): Degree of avoidance hardness

For each area indicated on the provided map, respondents were asked how hard they tried to avoid the area. As there was a choice of alternative answers, show cards were offered to the respondent so that they could keep the options firmly in their mind whilst looking at the map (see Figure 19) (Oppenheim, 1996). The respondents were asked to choose only one of the five potential answers per area. These five answers were derived from Doran and Lees (2003), and were designed to correspond to a numerical value based on an ordinal 'Likert scale'. These values were displayed on the show card and were referred to as the 'avoidance hardness weights'.

How hard do you try to avoid those areas?	
1	Not hard at all
2	Not very hard
3	Don't know
4	Quite hard
5	Very hard

Figure 19. Interviewing show card A

Question asked: How hard do you try to avoid those areas?

5.1.2.2.c. Question Eleven (Part C): Environmental cues triggering fear of crime

Also for each avoided area indicated on the map, the respondents were asked what environmental cues, if any, triggered their fear of being robbed, beaten or attacked in that area. Another show card, with a list of 16 possible responses, was presented to the respondents (see Figure 20). The 16 environmental cues were chosen due to their relevance to the research setting and consistent reference throughout the literature. The labels used to describe the environmental cues were chosen in consultation with the Commander of the Kings Cross LAC. Respondents could name as many environmental cues as they felt necessary when indicating what prompted them to feel fearful of crime within those areas. Different answers could be given for each specific area they avoided. Interviewers documented these answers on the survey sheet so the respondents could focus on the task at hand. This question is an innovation developed in this research project. It refines the version used in the 2003 Kings Cross fear mapping exercise (Darcy, 2003).

	Social Factors
1	Junkies
2	Spruikers
3	Homeless people
4	Intoxicated persons
5	Prostitutes
6	Gangs
7	Loitering people
8	Pedestrian absence

	Physical Factors
9	Poor street lighting
10	Vandalism
11	Rubbish / syringes
12	Rundown / abandoned buildings
13	Offensive / degraded shops
14	Areas to hide
15	Blocked escape
16	Laneways

Figure 20. Interviewing show card B (front and back)

Question asked: in each area you avoid, which of these factors, if any, trigger you to feel fearful of being robbed, beaten or attacked?

The definition of each environmental cue, termed as a 'factor' in the survey question, was explained to the respondents when necessary. The tables on the following two pages provide definitions of the 16 environmental cues used in the survey. The tables explain why each cue was chosen for examination and the literature they are referred in.

Table 6. Definitions of the social factors used in the community safety survey

Social Factors	Definition	Reason/s for examining the environmental cue in Kings Cross
Junkies[143]	Intravenous drug users, users of other illicit drugs and drug dealers (Darcy, pers.com 12/3/04).	Drug use and dealing is considered a problem in Kings Cross (Darcy, 2005; ESNA, 2002). Comparison with Darcy's (2003) study.
Spruikers[144]	Employees, usually of adult entertainment venues, who encourage pedestrians to buy tickets and enter their premises (CoSC, 2006a).	The City of Sydney Council is of the view that *spruikers*, particularly those employed in sex-industry related premises, can cause problems for the public (CoSC, 2006a). Comparison with Darcy's (2003) study.
Homeless[145]	People living in community shelters or on the street.	Homelessness is considered a problem in Kings Cross (CoSC, 2006e; Darcy, 2005). Comparison with Darcy's (2003) study.
Intoxicated persons[146]	People who have consumed alcohol or appear dunk.	Intoxicated persons are considered a problem in Kings Cross (CoSC, 2006e; Darcy, 2005). Comparison with Darcy's (2003) study.
Prostitutes[147]	Sex workers.	Prostitution is considered a problem in Kings Cross (Darcy, 2005; ESNA, 2002). Comparison with Darcy's (2003) study.
Gangs[148]	Groups of people, who generally appear menacing or who illicit feelings of concern in pedestrians.	Historically, gangs and gang related crime have been a problem in Kings Cross (Butel & Thompson, 1984; Ellis, 1971; Whitaker, 2002)
Loitering people[149]	People who appear to have no purpose for being where they are; 'up to no-good'	Comparison with Darcy's (2003) study.
Pedestrian absence[150]	Lack of other pedestrians.	Pedestrian absence is associated with increased fear of crime and could support or undermine the disorder and decline theory in Kings Cross.

[143] Other sources that examine *junkies*: Covington & Taylor, 1991; Darcy, 2003; Perkins & Taylor, 1996;, 2003; Skogan, 1990; Perkins *et al*, 1993 in Ross & Mirowsky, 1999.
[144] Other sources that examine *spruikers*: Darcy, 2003.
[145] Other sources that examine *homeless people*: Darcy, 2003; Perkins *et al*, 1993 in Ross & Mirowsky, 1999.
[146] Other sources that examine *intoxicated persons:* Covington & Taylor, 1991; Darcy, 2003; Skogan, 1990; Ross & Mirowsky, 1999.
[147] Other sources that examine *prostitutes:* Darcy, 2003; Perkins *et al*, 1993 in Ross & Mirowsky, 1999.
[148] Other sources that examine *gangs:* Perkins & Taylor, 1996; Rohe & Burby, 1988 and Perkins *et al*, 1993 in Ross & Mirowsky, 1999; Skogan, 1990.
[149] Other sources that examine *loitering people:* Darcy, 2003; Skogan, 1990; Ross & Mirowsky, 1999.

Table 7. Definitions of the physical factors used in the community safety survey.

Physical Factors	Definition	Reason/s for examining this environmental cue in Kings Cross
Poor street lighting[151]	Absence or lack of adequate street lighting.	Comparison with Darcy's (2003) study.
Vandalism[152]	Property damage by vandals, for example graffiti or broken windows.	Vandalism is considered a problem in Kings Cross (Darcy, 2005).
Rubbish / syringes[153]	Litter on streets/thoroughfares that is not in bins, and equipment used in the drug injection.	Rubbish is considered a problem in the area (ESNA, 2002). Comparison with Darcy's (2003) study.
Rundown / abandoned buildings[154]	Vacant buildings or those that are dilapidated or in a state of disrepair.	The City of Sydney Council acknowledges abandoned buildings negatively impact the community (CoSC, 2001).
Offensive / degraded shops[155]	Shops that offend or appear dilapidated.	The City of Sydney Council acknowledges shops that are offencive can negatively impact the community (SoSS, 2000).
Areas to hide[156]	Places where an attacker could seek refuge, for instance hiding behind bushes.	Areas to hide are associated with fear of crime and effect town planning (Fisher & Nasar, 1992; Nasar *et al*., 1993).
Blocked escape[157]	An area where escape would be difficult in the event of an attack, for instance stairways.	The City of Sydney Council acknowledges entrapment spots negatively impact the community (CoSS, 1997b).
Laneways[158]	Small thoroughfares, generally pedestrian only although some are big enough for one-way traffic.	Laneways are associated with increased fear of crime and there are many laneways in the study site. Comparison with Darcy's (2003) study.

[150] Other sources that examine *pedestrian absence:* Jacobs, 1961; Loukaitou-Sideris, 1999; Samuels & Judd, 2002.
[151] Other sources that examine *poor street lighting:* Darcy, 2003; Fisher & Nasar, 1995.
[152] Other sources that examine *vandalism:* Lewis & Maxfield, 1980; Perkins *et al.*, 1993 in Ross & Mirowsky, 1999; Skogan, 1990.
[153] Other sources that examine *rubbish / syringes:* Covington & Taylor, 1991; Darcy, 2003; Doeksen, 1997; LaGrange, Ferraro & Supancic, 1992 in Ross & Mirowsky, 1999; Perkins *et al.*, 1993; Skogan, 1990; Taylor & Covington, 1993
[154] Other sources that examine *rundown / abandoned buildings:* Covington & Taylor, 1991; Doeksen, 1997; Ferraro & Supancic, 1992; Gates & Rohe, 1987; LaGrange, Lewis & Maxfield, 1980; Perkins & Taylor, 1996; Rohe & Burby, 1988 in Ross & Mirowsky, 1999; Skogan, 1990.
[155] Other sources that examine *offensive / degraded shops:* Darcy, 2003.
[156] Other sources that examine *areas to hide*, or *concealment:* Brantingham & Brantingham, 1994; Fisher & Nasar, 1992; Fisher & Nasar, 1995; Nasar & Jones, 1997.
[157] Other sources that examine *blocked escape:* Brantingham & Brantingham, 1994; Fisher & Nasar, 1992; Fisher & Nasar, 1995.
[158] Other sources that examine *laneways:* Darcy, 2003; Fisher & Nasar, 1995.

It is necessary to reiterate that the above environmental cues were chosen though an extensive literature review and an examination of the research setting. Highlighting this is important because Phillips and Smith (2003) criticise that researchers can intentionally or unintentionally label certain groups as 'incivil' from the outset of their studies. These groups are typically those who are disadvantaged and different, whom the public stereotype as being involved in crime and become scapegoats symbolically linked to crime (Blalock, 1967; Kelling & Coles, 1997). Such groups include those used in this survey, including homeless people, sex workers and drug users.

5.1.3. Section synopsis: An innovative fear of crime survey

Considerable thought went into the design of the survey used in this study. Considerations included the time taken to complete the survey, how easy the survey would be to complete and how the survey title and layout could encourage respondents to participate in and finish the survey. The socio-demographic questions integrated into the survey were chosen in accordance with a review of the literature into the variables that are associated with fear of crime. These questions mirror survey questions used in other studies so that potential comparison of results can be made. The questions in the survey's mapping section a development from those used in Doran and Lees (2003) and Darcy (2003) surveys. The mapping section questions are designed to allow the collection of spatial fear of crime data, which are used to produce the fear maps and consequently answer the thesis research aims. Now that the survey has been introduced, the next section will describe the interviewing procedure.

5.2. The interviewing procedure

As outlined in the research design chapter, the data collection phase of this research study consisted of interviewing members of the public in Sydney's inner east region. This section outlines procedures undertaken during this phase. It describes the choice of standardised interviewing, the interviewer training, the process of respondent recruitment and how informed consent was obtained.

5.2.1. Standardised interviewing

This section describes why standardised interviewing was chosen as the method of data collection for this thesis. Firstly, in comparison to questionnaires delivered by post, those that are presented to potential respondents in person typically have much higher response rates (Oppenheim, 1996; Robson, 1996).

Secondly, the presence of an interviewer can overcome a number of problems inherent in self-administered questionnaires. Interviewers are more effective than covering letters in providing respondents with and acceptable justification for the research project (Oppenheim, 1996). The use of trained interviewers allows researchers to guide the data collection procedure. In self-administered questionnaires the respondents are able to answer questions out of order or carelessly overlook questions. Interviewers ensure this does not occur (Punch, 1998). Standardised interviewing also allows for misunderstanding to be reduced. Interviewers correct misunderstandings by providing prepared explanations to certain problems and offer assistance to respondents with reading or language difficulties (Oppenheim, 1996).

Despite these positives, the presence of interviewers in the survey process can lead to various interviewer biases and consequently errors in the collected data (Oppenheim, 1996). Interactions between interviewers and respondents can be influential. Differences or similarities between their ages, ethnic origin, gender and status can affect rapport and the extent to which the respondents seek to please or oppose the interviewer. Likewise, the skills, knowledge, experience and personality of interviewers can affect the respondents when answering questionnaires (Robson, 1996). Other forms of interviewer error, leading to bias in the dataset, include continually offering a one-sided explanation of a particular question (Oppenheim, 1996). These biases can be minimized with interviewer training, described next.

5.2.2. Interviewer training

Administration of the survey was undertaken with the aid of Masters of Criminology Students at Sydney University and members of the NSW Police

'Volunteers in Policing' program. Punch (1998) advises that the involvement of individuals other than the researcher in the interviewing process may involve a tradeoff between obtaining a smaller, better quality, dataset or a larger, poorer quality, dataset. Explicit interviewer assessment and training is therefore desirable (Robson, 1996; Oppenheim, 1996). Thus, in order to maximize the research sample size while maintaining a high level of quality data, the participating interviewers received comprehensive training. The interviewer training consisted of the following stages:

1. An orientation to Kings Cross, including background information on:[159]
    a. Crime in the Kings Cross LAC.
    b. The socio-demographic characteristics of the Kings Cross LAC.

2. A review of related literature on fear of crime, including background information on:
    a. The meaning of the fear of crime.
    b. The consequences of the fear of crime.
    c. Methods used to measure the fear of crime.
    d. Symbols associated with the fear of crime and socio-demographic predictors associated with the fear of crime.
    e. The value of the research project.

3. An introduction to the survey, including 'hands on training' and background information on:
    a. The chosen survey questions.
    b. How the interviewing process would be carried out.
    c. The role of the interviewer.

4. An overview of the ethical considerations involved in the interviewing process, including:
    a. A reading of *Part 1 – Principles of Ethical Conduct* of the *National Statement on Ethical Conduct in Research Involving Humans (1999).*

[159] This was presented by the then Kings Cross LAC Commander and a Sergeant

b. An explanation of the terms: ‘consent’, ‘voluntary’, ‘privacy’ and ‘confidentiality’.

Furthermore, Associate Professor Julie Stubbs from the Faculty of Law at the University of Sydney briefed the Masters of Criminology Students and myself on interviewing techniques. Julie Stubbs is highly experienced in recruiting respondents and performing surveys that focus on fear of crime. In addition to this formal training session, those persons interested in continuing were asked to practice the survey under low risk-conditions, enabling them to receive feedback on their performance. This preparation is recommended to maximise interviewer competency and therefore data quality (Robson, 1996).

Following the interviewer training, those interested in continuing were asked to sign a ‘consent form’ to participate in the research project (see Figure 96 in Appendix A). In these consent forms the interviewers agreed to:

- Take part in the project by interviewing members of the general public on the streets of Kings Cross;
- Gain informed consent from the survey respondents that they would be interviewing (Under Section 1.7 to 1.11 of the *National Statement on Ethical Conduct in Research Involving Humans,* 1999);
- Show respect, beneficence[160] and justice when interviewing the survey respondents (under Section 1.1 to 1.6 of the *National Statement on Ethical Conduct in Research Involving Humans,* 1999);
- Keep the information that they would be recording and handling confidential, as far as the law allows; and
- Not use or devolve the information that they would be recording and handling without prior consent from the owner of the intellectual property.

After the interviewer training and signing of the consent forms, the interviewers proceeded to recruit the respondents. The recruitment process is discussed next.

[160] The obligations to maximise possible benefits and minimise possible harms.

5.2.3. Recruitment of respondents

Following advice from the Kings Cross Police Commander, random door knocking was eliminated as a recruitment process due to safety concerns for the interviewers themselves (Darcy, pers com, 17/3/04). An offer was made to conduct the surveys in local community meetings. It was assumed that only a select group of 'community conscious' residents would attend the meetings, therefore this setting was declined. With the intention of sampling both residents of, and visitors to, the Kings Cross study area, a public street setting for surveying was chosen. This approach was also used in the 2003 fear mapping exercise in Kings Cross (Darcy, pers com, 17/3/04).

Interviews predominately took place along Darlinghurst Road, Macleay Street and Victoria Street, in Fitzroy Gardens and at the front of the Wolloomoloo Police Station (see Figure 97 in Appendix A). These streets were chosen as the major field sites to maximize interviewer safety (Darcy, pers com, 17/3/04). To a lesser extent, interviews were conducted in the backstreets of Kings Cross. The interviewers moved from site to site throughout the day. At each site, the closest individual was approached and asked if they would take part in a study on community safety and crime. If this person declined, the next closest individual was approached, and so on, until someone agreed to participate. Informed consent, discussed in the next section, was then obtained before proceeding with the surveying.

School children were not approached for interviewing. If the willing respondent was under the age of 18 years the interviewer declined their participation. Survey respondents were not asked to identify themselves.[161] A target sample size of 300 was decided upon. A larger sample size was discounted due to limits on project time and resources. The survey was conducted in April and May 2004, between the hours of 7am and 6pm. These hours were chosen due to time constraints of interviewers and to incorporate the observed temporal shifts in the demographic groups occupying the public spaces in the region (Darcy, pers com, 17/3/04). For example, it allowed for surveying of workers entering or leaving the study area (present from 7am to 9am and

[161] It was a concern that people in Kings Cross would not want their names given to a study that was associated with Police and would be concerned that sensitive information given in the survey could be released to others who may know them personally.

4:30pm to 6pm), the elderly (present from 9am to 11:30am), and intravenous drug users and dealers (present from 11:30am onwards).

5.2.4. Informed consent

Advanced publicity, featuring information about the research project and an invitation to participate in the corresponding survey, is considered to have a positive effect on survey response rates (Oppenheim, 1996). As Punch (1998) indicates, survey respondents are also more likely to cooperate and provide improved quality data when they are informed about the purpose and context of the research, about confidentiality and anonymity, about how the information they provide is used, and about uses of the information. In light of this, flyers covering such issues were distributed throughout the Kings Cross LAC in the week prior to the commencement of surveying (see Figures 124 and 125 in Appendix A for the information flyer and the area it was distributed). Additionally, the flyer was published in the local newspaper, *The Wentworth Courier*.

During the survey process, potential respondents were also offered an information sheet providing them with additional information regarding the survey and research project (see Figure 100 in Appendix A). The information handout covered the above-mentioned issues discussed in the flyer and provided contact details of myself and the Human Research and Ethics Committee. These contact details were given so that the survey respondents could access further information, provide feedback, or lodge complaints or ethical concerns with an independent body.

Using this information handout, or verbally outlining its contents to the potential survey respondent, the interviewers could inform participants about the context of the research, the use of the survey data and issues of respondent confidentiality and anonymity. This enabled the interviewers to obtain informed consent from respondents before proceeding to complete the survey. This consent took the form of an affirmative answer to the question 'Would you like to take part in the survey?' A summary of this survey is presented in the next section.

5.3. Summary of the survey and interviewing methods

Standardised interviewing was chosen for this study as an appropriate method of data collection. This is largely because the presence of an interviewer overcomes many of the problems inherent in postal or self-administered questionnaires. High levels of quality data are promoted through comprehensive interviewer training, which minimises potential interviewer biases in the interviewing procedure. Interviewers participating in this study thus received a comprehensive induction to Kings Cross, fear of crime, how to conduct the surveying, ensure informed consent and recruit the respondents. The process of recruiting the respondents was devised to increase the likelihood of obtaining a large, suitable data sample. How this data was used in the production of the avoidance maps is discussed in the next methods chapter.

6. Methods: Avoidance mapping

This chapter outlines the GIS methods used to produce the three-dimensional (3D) avoidance maps, which depict areas the respondents avoid because they are afraid of being robbed, beaten or attacked. The methods enable the fear of crime data to be displayed with informative fear maps, without the need for complex spatial modeling. A brief comment on the use of spatial visualisation is firstly given in this section. Next, the methods used in the production of two-dimensional (2D) 'avoidance density' and 'avoidance hardness' maps are detailed. The avoidance density maps illustrate the number of respondents avoiding each area of the study site. The avoidance hardness maps show the average degree to which the respondents tried to avoid each area. The subsequent two sections of this chapter describe the process used to select a few unique or contrasting environmental cues for 3D fear mapping, and the methods used to produce the 3D fear maps. Lastly, a discussion of the methods used to produce the crime maps is presented.

6.1. Spatial data visualisation using GIS

A GIS was used in this study to produce fear maps that show the spatial distribution of avoidance and perceived environmental cues. As is common when examining data in a GIS, the spatial fear of crime dataset obtained with survey Question 11 can be analysed using a number of different statistical techniques. These techniques are commonly referred to as spatial analysis models. Spatial statistics are extremely useful for investigations where the dataset involved does not have noticeable relationships or clustering. Spatial statistics are therefore predominately used when there are no obvious patterns within the spatial data. However, the method of data visualisation developed in this thesis was designed to enable any patterns within the data to be easily identified. It was therefore not necessary to perform any spatial modelling on the dataset. Spatial models often require a large dataset and with the small study site used in this study, most forms of spatial analyses would not operate effectively. Furthermore, in this study the relationship between fear of crime and the different environmental cues or socio-demographic groups is non-stationary. Consequently, the methods used in this study employ easily replicable spatial

visualisation methods, rather than complex modelling methods, to produce the 2D avoidance density, 2D avoidance hardness maps, and the overall 3D fear maps. The methods are detailed in the next sections.

6.2. Production of the two-dimensional maps

In order to produce the accumulative 2D avoidance density and avoidance hardness maps it was necessary to firstly produce a series of individual maps, which would then be combined. These individual maps are digital copies of each survey map, which the respondents marked with areas they avoid due to fear of crime. The making of the individual maps involved scanning, geometric transformation, raster cleanup, vectorisation, attribute assigning, rasterisation, value changing and projecting, and grid adding processes[162] (see Figure 21 on the following page). However, before these processes are detailed, a note on the printing of the survey maps is presented.

[162] These terms are defined in the glossary and in footnotes on the following pages.

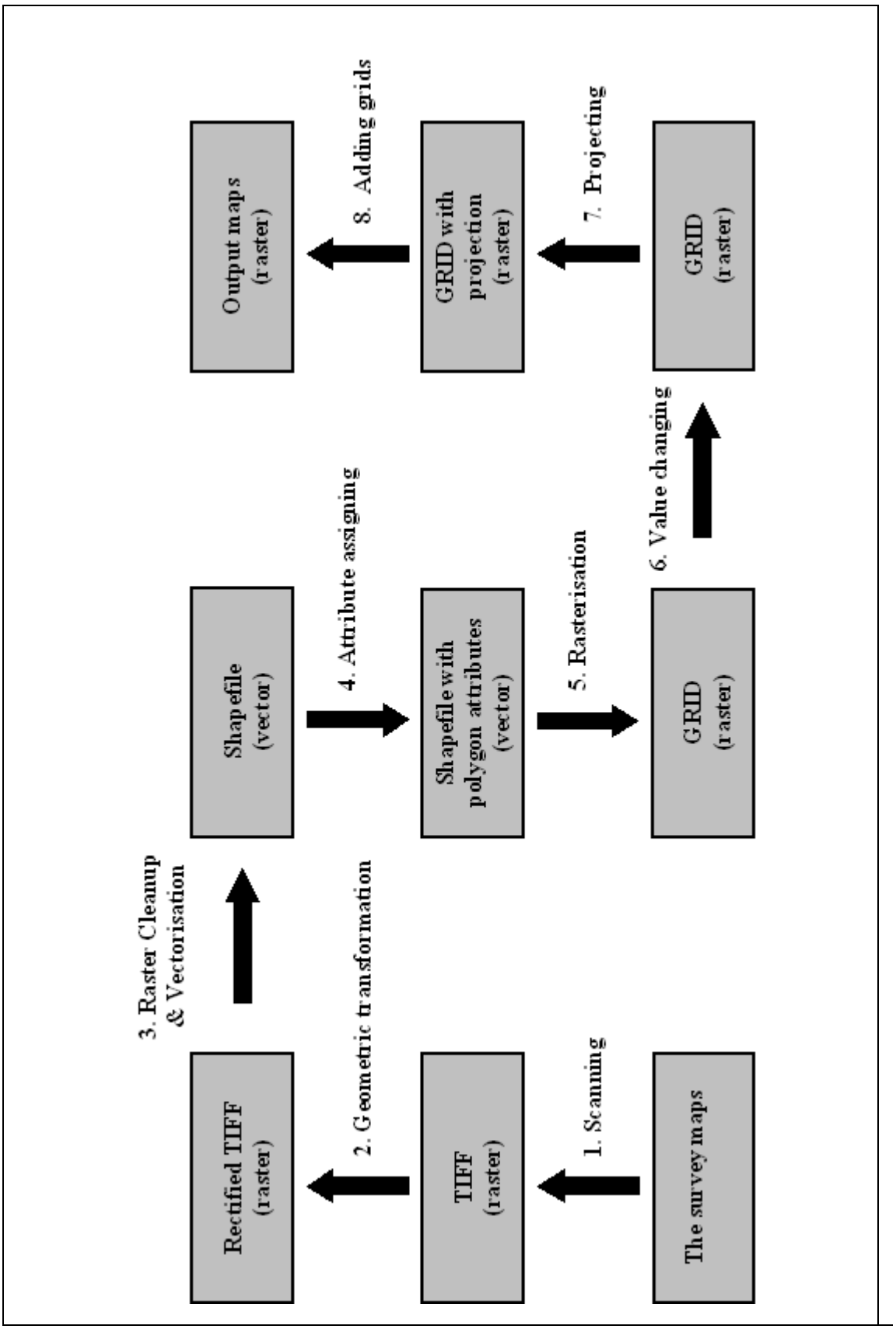


Figure 21. The eight steps used to produce the 2D avoidance maps

6.2.1. Printing the original survey maps

The map chosen for use in the survey is a variation of the UBD's street directory map of the region. A UBD map was chosen due to its familiarity to members of the public and it's ease of understanding. The UBD map was scanned at 300 dots per image as a colour photograph, using Twain Acquire software. In order to enhance map readability, unnecessary themes were omitted from the original UBD map using Adobe Photoshop. These included the street directional arrows, hotels, public telephones, pedestrian crossings and parks. Due to the cost of printing, the original colour map was converted into grey scale. A north arrow was added to the map so that survey respondents could orientate themselves when determining areas that they avoid. A larger A3 sized colour map was also provided to those survey respondents who had trouble determining locations. Fiducial points[163] were also added to the map so that it could be georeferenced with greater ease in the geometric transformation process. A single photocopier was used to print the maps to ensure differences in paper distortions occurring during printing were minimized. Survey respondents were provided with black marker pens when completing the survey. Black markers were used so that the grey background streets could be distinguished from the areas avoided by the survey respondents and removed during the scanning process.

6.2.2. The scanning process

Each survey map was scanned[164] using Twain Acquire software. The maps were scanned as a 'black and white drawing' with a resolution of 300 dots per image. During the scanning process the grey background displaying the street network was omitted using the 'brightness' tool, leaving only the marked areas and the map outline, including fiducial points[165], in black. The degree of 'brightening' depended on the thickness of the lines drawn on the map by the survey respondent. When the marked lines were

[163] A fiducial point is a visually identifiable point on a non-georeferenced image. The same point can also be identified on another image that has a coordinate system, so that the coordinates for the point can be obtained and then assigned to the non-georeferenced image.
[164] The process of capturing data from hard copy maps or images in raster format using a device called a scanner. The scanner sweeps a light beam across the surface of the map or image and records the information in raster format (ESRI, 2004).
[165] A control or visually identifiable point on a non-georeferenced image. The same point can also be identified on another image that has a coordinate system, so that the coordinates for the point can be obtained and then assigned to the non-georeferenced image.

thick and clear more brightening could take place than if they were thin and patchy. Higher levels of brightening enhanced removal of the grey background. Therefore, the grey background in those maps with thin and patchy marked lines could not always be completely removed from the scanned image. This background 'dirt' was eradicated during the raster cleanup stage, discussed in section 6.2.4. The scanned map images were saved as Tag Image File Format (TIFF) files. TIFF file format was chosen as it enabled the images to be imported into ArcGIS, as raster[166] images, without any prior modification.

6.2.3. The geometric transformation process

Geometric transformation[167] was performed on each TIFF image so that the marked areas on each map could be accurately aligned with the corresponding area represented by the GIS road network. This meant the images' 'image-space' coordinate system would be georeferenced, or correlated, with the 'real-world' co-ordinate system of the GIS road network. The Geographic Coordinate System used was the Geocentric Datum of Australia 1994 (GCS_GDA_1994).

In order to georeference the TIFF image to the GIS road network a number of recogniseable features were found on each map and used to create control points. These features were the street junctions of: Onslow Place and Onslow Avenue; Oswald Lane and Barcom Avenue; Peters Street and Bourke Street; and Bland Street and Bourke Street. By selecting control points on each map, the georeferencing tool in ArcMap was used to build an affine polynomial transformation that aligned the image with the GIS road network.

[166] A spatial data model that defines space as an array of equally sized cells arranged in rows and columns. Each cell contains an attribute value and location coordinates. Unlike a vector, which stores coordinates explicitly, raster coordinates are contained in the ordering of the matrix. Groups of cells that share the same value represent geographic features (ESRI, 2004).
[167] Also known as geometric transformation, polynomial transformation, or rectification. The process of assigning coordinates from a known reference system, such as latitude/longitude, to the page coordinates of a raster (image) or a planar map. Georeferencing raster data allows it to be viewed, queried, and analysed with other geographic data (ESRI, 2004).

The affine transformation function, used for geometric transformation in ArcMap 8.3, is:

$$x' = Ax + By + C$$
$$y' = Dx + Ey + F$$

where x and y are coordinates of the input layer and x' and y' are the transformed coordinates. A, B, C, D, E and F are determined by comparing the location of source and destination control points. They scale, skew, rotate, and translate the layer coordinates. The affine transformation requires a minimum of three displacement links (McDonnell & Kemp, 1995).

A new shapefile[168] of the fiducial points represented on the TIFF image was then created. Using the fiducial points in this shapefile, each survey image was georeferenced to the GIS road network (also using the georeference tool). The georeferenced images were then rectified, using the rectify tool, so that the maps retained their correct position in the 'real world' coordinate space.

6.2.4. The raster cleanup process

The rectified TIFF images (rasters) had to be 'cleaned' before they could be converted into shapefiles. The raster cleanup process was manually performed using the raster cleanup tool in ArcScan. It consisted of the following procedures:

- gaps in the boundaries of avoided areas were joined using 'paintbrush' tool;
- the avoided areas were filled using the 'fill' tool;
- background 'dirt' was removed using the 'erase' tool; and
- the study area border and fiducial points were removed using the 'erase' or 'magic erase' tool.

[168] A shapefile is a vector data storage format for storing the location, shape, and attributes of geographic features (ESRI, 2004). A vector is a coordinate-based data model that represents geographic features as points, lines, and polygons. Attributes are associated with each feature, as opposed to a raster data model, which associates attributes with grid cells (ESRI, 2004).

6.2.5. The vectorisation process

Following the raster cleanup, the images were converted into shapefiles using the vectorisation[169] tool in ArcScan. The settings used in this procedure are outlined in the Table 8.

Table 8. The vectorisation settings used in the raster to vector conversion.

Setting	Option/ Value	Reason
Intersection solution	Median	To preserve the slope of the raster line where two or more raster lines met and formed an intersection.
Maximum line width	100 (max 100)	To ensure the thicker raster lines made by the survey respondents' marker qualify for raster tracing.
Compression tolerance	0.025 (max 50)	To ensure the shape of the output vector lines (in terms of number of vertices that are used to construct line features) was as similar as possible to the input raster lines.
Smoothing weight	1 (max 20)	To ensure the shape of the output vector lines (in terms of smoothness) was as similar as possible to the input raster lines.
Gap closure tolerance	1 (max 1000)	To ensure only small accidental gaps in the raster lines where closed during vectorisation.
Fan angle	5 (max 180)	To ensure the direction of the line created when closing accidental gaps did not meander far from the direction of the original line.
Hole size	100 (max 100)	To ensure large holes within the raster lines will be treated as part of the raster line to be vectorised.

6.2.6. Assigning polygon attributes

The answers provided by each survey respondent who indicated that they avoided areas in the study area were entered into an individual Excel table. These tables were

[169] The conversion of raster data (an array of cell values) to vector data (spatial data held as a series of points, lines, and polygons) (ESRI, 2004).

saved as database file (format 4) so that ArcMap could read the file and assign the corresponding attributes to each polygon in the shapefiles. Therefore, the maps of each area avoided by a respondent could, for example, display the sex, age and income of the respondent and what factors triggered their fear.

6.2.7. The rasterisation process

Based on the avoidance hardness values for each polygon in the attributes tables, the shapefiles were then converted into grids in a rasterisation[170] process using the SHAPEGRID function in ArcInfo. The grid cellsize used was five metres. Conditional statements were then used to convert the un-avoided areas that had a value of 'no data' to a value of zero. This was necessary for the final stage. The Arc Macro Language scripts (AML) used in the rasterisation process was based on the following ArcInfo GRID formula: <output grid> = SHAPEGRID (<input shapefile>, <attribute used for conversion>, <cellsize>). An example AML is presented in Appendix A.

The AML used in the consequent grid value conversions was based on the following ArcInfo – GRID formula: <outgrid> = CON(<false expression> (<ingrid>), <true expression>, <expression of other values>). The AML used in this study is several pages long. An example AML is presented in Appendix A.

6.2.8. The projecting process

During the rasterisation process the projection[171] of the grids was lost. In order to overcome this, the grids were re-projected using the PROJECTCOPY function in ArcInfo. The AML used was based on the following ArcInfo formula: PROJECTCOPY GRID <input grid> GRID <output grid>. An example AML is presented in Appendix A.

[170] The conversion of vector data (spatial data held as a series of points, lines, and polygons) to raster data (an array of cell values) (ESRI, 2004).
[171] A method by which the curved surface of the earth is portrayed on a flat surface. This generally requires a systematic mathematical transformation of the earth's graticule of lines of longitude and latitude onto a plane (ESRI, 2004).

6.2.9. Adding the individual survey maps to produce avoidance density maps

To finish producing the 2D avoidance density maps, the individual survey grids were combined using the '+' function in ArcInfo. Each area avoided by each individual was assigned a value of one, as shown in Figure 22 on the following page. The resulting aggregate values were then classified as a percentage of the total number of survey respondents (using ArcMap to produce 2D maps). This method of classification allows for effective comparison between the environmental cues.

When producing the 2D avoidance hardness maps, the avoidance hardness weights were used to combine the individual survey maps, also using the '+' function. The resulting output values for each area represented an aggregate of all of the avoidance hardness weights for that area. To show the *average* degree of 'avoidance hardness' for the area, this aggregate output value was the divided by the total number of people avoiding that area. This is also shown in Figure 22. This returned the values to the original Likert-scale with real numbers from one to five. The real numbers were then classified to reflect this ordinal index in ArcMap.[172] It will be referred to as the 'Avoidance Hardness Index'.

The AML used to combine all of the grids was based on the following ArcInfo formula: <output grid> = <input grid1> + <input grid2>+ <input grid3> + <input grid4>… An example AML is presented in Appendix A. At the completion of these AMLs:

- the values in the final avoidance density maps have the formula

  output cell value = person1 + person2 + person3 ….
- the values in the intermediate avoidance hardness maps have the formula

  output cell value = (person1 x weight1) + (person2 + weight2) + ….

[172] The real number to integer rounding method used in this study classified the real numbers ranging from 0.5 to 1.4 as the integer '1',1.5 to 2.4 as the integer '2' and so on. This is different to the real number to integer rounding method that is automatically applied in ArcInfo when using GRID commands and that used in ArcMap when displaying data using integers. ArcInfo will classify the real numbers ranging from 2.0 to 2.9 as the integer '2'. In contrast, ArcMap will categorise real numbers ranging from 1.1 to 2.0 as the integer '2'.

The AML used to produce the final avoidance hardness maps was based on the following ArcInfo formula: <output grid> = <input grid1> / <number of avoiding respondents in that group>. An example AML is also presented in Appendix A. At the completion of these AMLs the values in the final avoidance hardness maps have the formula:

$$\text{output cell value} = \frac{((\text{person1} \times \text{weight1}) + (\text{person2} + \text{weight2}) + \ldots.))}{\text{total number of avoiding respondents in that group}}$$

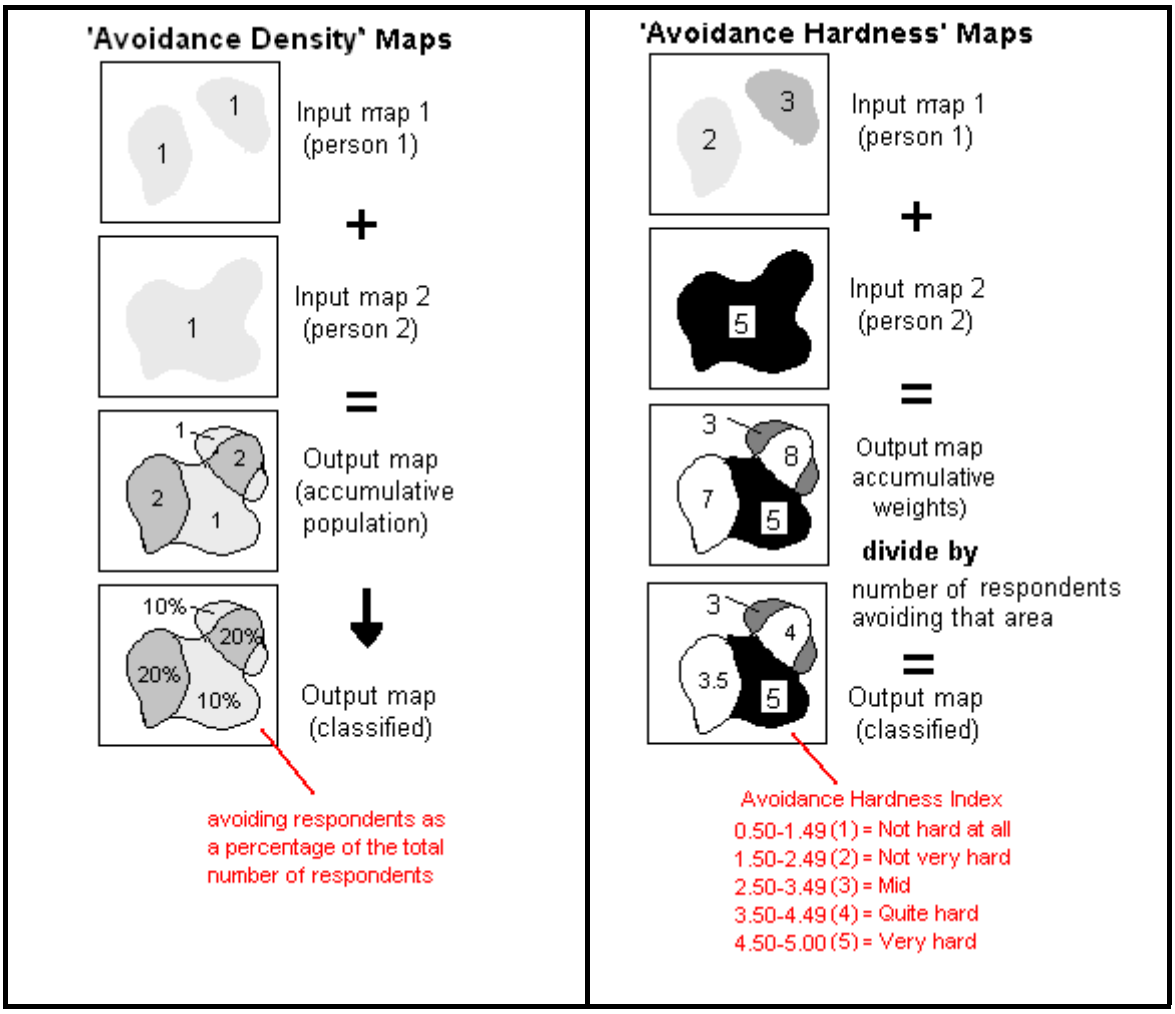


Figure 22. A visual representation of the 'grid adding' process in ArcInfo. The number of avoiding respondents in the example is ten.

6.3. Selecting environmental cues for 3D mapping

Each of the 16 environmental cues are mapped in 2D, creating the avoidance density and avoidance hardness maps that were later combined to produce the 3D avoidance maps. However, only selected environmental cues were mapped in 3D. The motivation behind producing the 3D avoidance maps is to demonstrate the capacity fear mapping has for providing new information, particularly regarding the environmental cues that trigger public fear of crime. An assessment of the 2D avoidance density maps was performed to determine whether the different environmental cues triggered mixed patterns of avoidance. It was also used to select environmental cues with the most unique or contrasting avoidance patterns, which would later be mapped in 3D. This process required the production of three other types of 2D avoidance density maps for each environmental cue.

The additional three avoidance density maps reclassified the aggregate avoidance density data to highlight differences in the spatial patterns of avoidance. For instance, the classifications respectively illustrated respondent avoidance density, areal and temporal differences in the avoidance patterns for each environmental cue. By facilitating comparison of the avoidance patterns, the extra maps allow for the selection of a few example environmental cues for investigation in 3D. An assessment of the 2D avoidance hardness maps was also performed to aid the selection process.

The first method of data classification was employed to help rank the environmental cues from highest to lowest according to the number of respondents avoiding each area of the study site (because the environmental cue triggered their fear of crime). The avoidance density data was displayed using a colour ramp, moving from red through green to blue. The range of data was stretched to the limits of the colour ramp. For each map, the minimum parameter of the stretch was zero. In order to most effectively reveal any spatial patterns within a dataset, the maximum value of the stretch should closely reflect the highest value within the data. The highest number of respondents avoiding an area of the study site was 76 during the night. To reflect this, a value of 80 was chosen as the maximum parameter of the stretch for each of the night maps. Having a consistent legend between all night maps meant the fear maps for each environmental cue could be compared and ranked. The highest number of respondents

avoiding an area of the study site during the day was 34. Each of the day maps was assigned the same legend with a maximum value of 40.

The next method of data classification facilitated the illustration of temporal changes between the number of respondents avoiding each area of the study site in the day and night (because the environmental cue in question triggered their fear of crime). For example, whether there was a large increase in avoidance from the day to the night. The symbology used in these maps grouped the avoidance density data into classes of two avoiding respondents. The lowest class began at zero and the highest class ended at 80. As previously mentioned, the value of 80 accounted for the fear map with the highest number of respondents avoiding a certain area. The same legend was applied to all maps, both day and night. This enabled comparison between the day and night maps for each of the environmental cues.

The last classification helped identify areal differences in the patterns of avoidance for each environmental cue. For instance, whether the respondents who stated 'Environmental Cue A' triggered their fear of crime avoided different areas from the respondents who stated 'Environmental Cue B' triggered their fear. However, unlike the maps used to compare and rank the environmental cues according to number of avoiding respondents, these maps do not use a fixed and common value as the maximum parameter of the stretch. Each of these maps instead uses the true maximum value within dataset as the maximum parameter of the colour ramp stretch. This value will be the highest number of respondents avoiding an area of the study site. As avoidance numbers differed for each environmental cue, each map was therefore assigned a different legend. This prevented comparison between the environmental cues based on the number of avoiding respondents. Alternatively, the classification highlighted and allowed comparison of any areal differences in patterns of avoidance for each environmental cue.

After reviewing the 16 environmental cues for unique or contrasting avoidance patterns, the data corresponding to the selected few was then mapped to create the example 3D avoidance maps. This process is described in the following section.

6.4. Production of three-dimensional fear maps

Spatial analysis of fear of crime-related avoidance patterns using 3D maps is apparently innovative, although similar visualisation techniques are common in other application areas. The three-dimensionality allows for simultaneous analysis of avoided areas according to avoidance density and degree of 'avoidance hardness'. ArcScene was used to present the unclassified 2D avoidance density maps in 3D, with number of avoiding respondents (avoidance density) being represented by the elevation of the map. The 2D classified avoidance density maps were converted into line shapefiles using the surface analysis - contour tool in ArcScene. These shapefiles were then draped over the unclassified 3D avoidance maps, like contour lines. This revealed what proportion of the total sample the numbers represented, allowing comparison between maps symbolizing different environmental cues. These divisions will be referred to as 'population percentile bands'. The contour intervals (gaps between each population percentile band) for each of the 3D maps were based on the number of people representing 5% of the total sample population in that category. The final numbers used are displayed in Table 9.

Table 9. The population contour intervals between the population percentile bands on the three-dimensional maps

	Day	**Night**
Number of avoiding respondents	138	252
Five percent of avoiding respondents	7	13

The 2D avoidance hardness maps were also draped over the corresponding 3D fear maps. Figure 23, on the following page, visually represents this 3D process using a 2D graph that signifies a cross-section of a 3D avoidance map. Each category making up the Avoidance Hardness Index was displayed using a colour ramp so that variation within the avoidance hardness data could be visualised. This meant information was not lost or misrepresented through the classification of data into a category with discrete boundaries and consequent display of that category with a single colour.[173]

[173] For example, the avoidance hardness category '2' is made up of real values ranging from 1.5 to 2.4. If the data in this category consisted predominantly of values between 2.1 and 2.4 then this would not be revealed if the category were displayed using a single colour. In contrast, a colour ramp displays such variation.

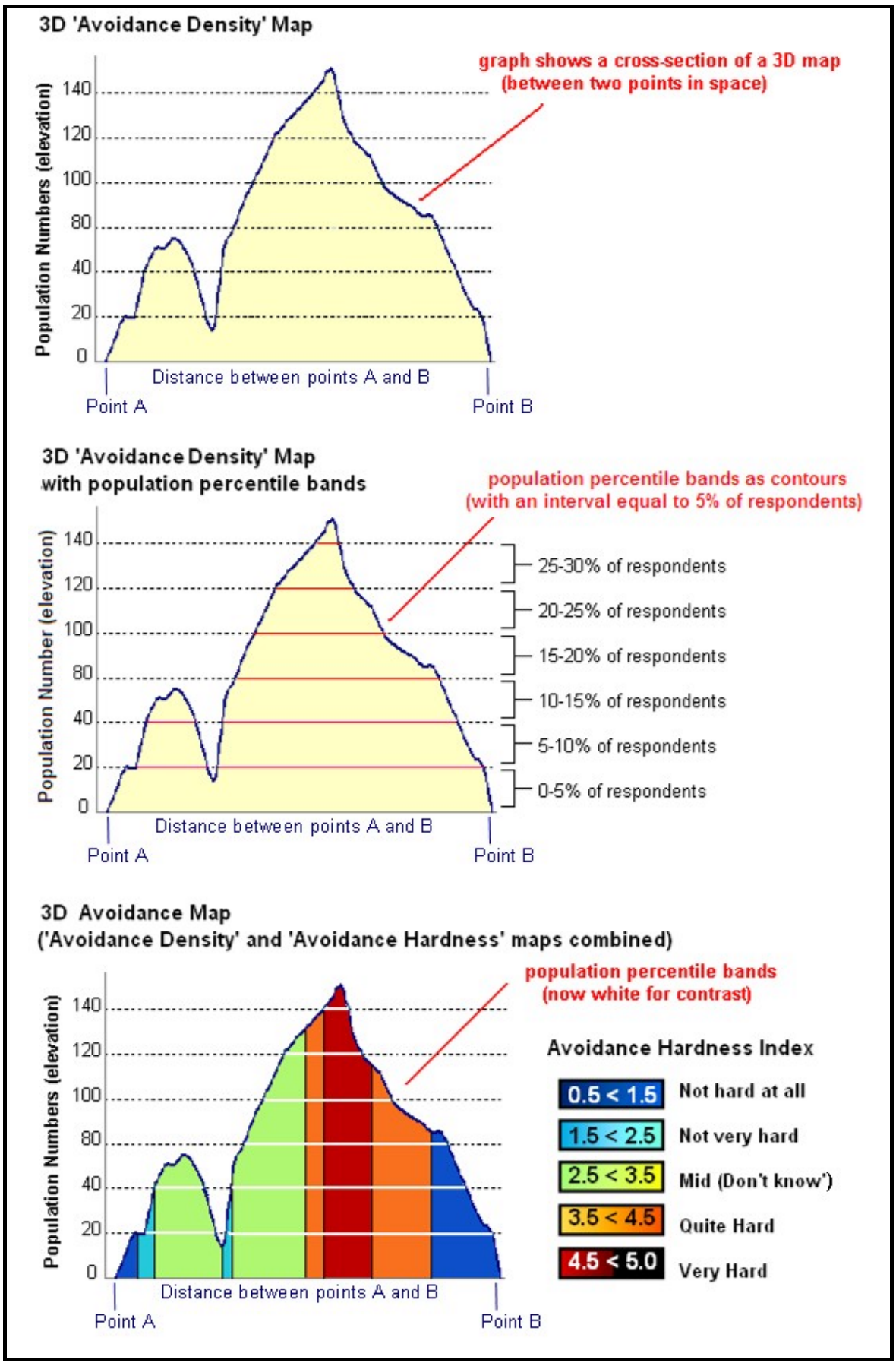


Figure 23. A visual representation of how the 2D maps were combined for 3D display.

The number of respondents in the example is 400. The maximum number of avoiding respondents in the cross-section is approximately 150 (33% of the total).

Each of the 3D avoidance maps was displayed using the same scene, view and layer settings. This was done to assist in making comparisons between the avoidance maps for the different environmental cues. The scene, view and layer settings were chosen to heighten the clarity of the data visualization. The z-factor in all of the maps was 0.00004.[174] Details of the other settings are provided in Appendix B. 'Flyby' movies of the 3D avoidance maps were then created using the animation tool in ArcScene. Where still pictures of the 3D avoidance maps allow visualisation from one angle at a time, these flybys enable a moving visualisation showing the fear maps from multiple angles. This method of presentation therefore increases the amount of information in the fear maps that can be shown to onlookers.

6.5. Production of the crime maps

NSW Police supplied spatial crime data indicating where cases of robbery and assault took place in the six-month period prior to interviewing (October 2003 to April 2004). This data was transferred from a text document into an Excel table and saved as a database file (format 4) so that it could be incorporated into the GIS. A point shapefile was created using the 'create feature class – from XY table' command in ArcCatalogue and displayed in ArcMap.

6.6. Summary of the fear mapping methods

The avoidance mapping methods are intended to produce realistic avoidance maps that have the potential to provide new information for the understanding of public fear of crime. They are designed so that complex spatial data analyses are not necessary and so that multiple GIS assistants can be trained and contracted to perform much of the GIS work, should these methods be replicated in a future study. While the methods used to produce the 2D and 3D avoidance maps are neither new nor unique when compared to geographic studies in other research fields, they are innovatively applied in this thesis to map fear of crime. This is particularly the case with the methods of 3D visualisation and the idea of mapping avoided areas based on the perceived

[174] In an elevation or terrain model, z-value or factor represents elevation. In other studies, like this one, it represents the density or quantity of a particular attribute (avoidance) (ESRI, 2004).

environmental cues that trigger public fear of crime. The results of the mapping methods are presented in the results chapters. The non-spatial data are presented in the first results chapter, before the 2D and 3D avoidance maps are displayed in the two subsequent results chapters. Figure 23 on page 138 of this chapter can be used to aid interpretation of the 3D avoidance maps.

7. Results: Sample characteristics

This is the first of three results chapters. This results chapter presents the general non-spatial survey results. They feature the respondents' answers to questions 1 to 10 (the questions relating to the general sample characteristics and socio-demographic information), and question 11 (the mapping section). The sample characteristics are briefly compared to Sydney's inner-east demographic.[175] The following two results chapters present the spatial survey results, the 2D and 3D fear maps respectively.

7.1. Questionnaire section: Socio-demographic questions

This section displays the answers provided by the survey respondents for questions 1 to 10 in the survey. These questions can be reviewed in section 5.1.2 of the methods.

7.1.1. Question One: Sex

Slightly more males than females were interviewed (see Figure 24). This is consistent with the male to female ratio in Sydney's inner-east. Only 1% of the respondents did not answer question 1.

Sex	Count
Male	202
Female	177
No answer	2
Total	381

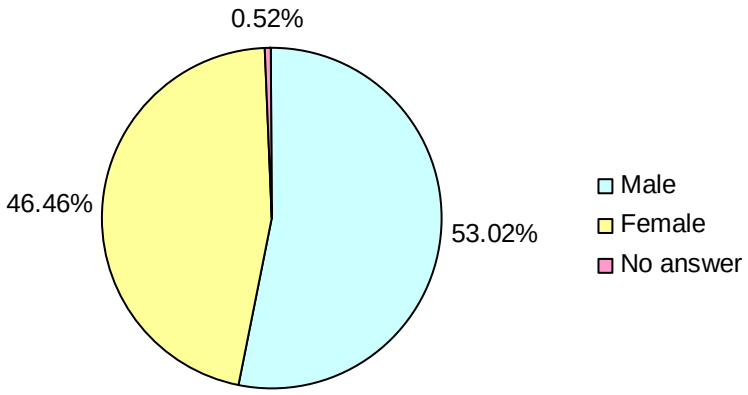


Figure 24. Respondent distribution according to sex (numbers and percentages).

[175] Despite this, recall from the research design chapter that a representative sample was not sought in this study.

7.1.2. Question Two: Age

Figure 25 and Figure 26 show the majority of respondents were in the middle age group (46% aged between 30-59). Almost 25% of respondents were over the age of 60 and 30% of respondents were between the ages of 18 and 29. While the percentage of respondents in the later age group is consistent with the local demographic (32%[176]), there is a much higher proportion of respondents aged over 60 in the research sample. In line with this, there is a lower proportion of respondents in the 30-59 age group in the sample. Only 1% of the respondents did not answer question 2.

Age	Count
18-23	57
24-29	58
30-35	43
36-41	32
42-47	31
48-53	41
54-59	30
60-65	27
66-71	18
Over 72	42
No answer	2
Total	381

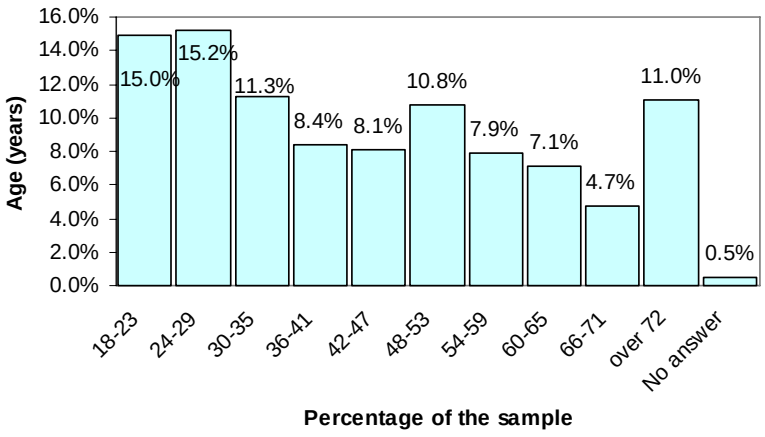


Figure 25. Respondent distribution according to age (numbers and percentages) – original categories.

Age	Count
18-29	115
30-59	177
60 onwards	87
No answer	2
Total	381

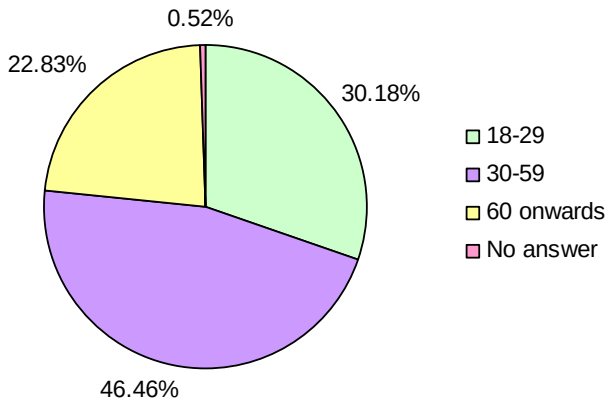


Figure 26. Respondent distribution according to age (numbers and percentages) – new categories.

[176] Thirty-two percent of the Inner-east population over the age of 18 years.

7.1.3. Question Three: Housing tenure type

In terms of housing tenure, the majority of the sample were owner occupiers (45% and non-owner occupiers (36%). Less than 10% of the respondents lived in government housing or were staying in backpacker accommodation and 2% of the sample lived in a community shelter (see Figure 27). Overall these percentages are consistent with general housing tenure in the inner-east, however more of the sample are owner-occupiers in comparison to the local demographic (36%). Only 1% of the respondents did not answer question 3.

Housing type	Count
Government housing	34
Non owner-occupier	170
Owner-occupier	135
Backpacker	29
Community shelter	8
No answer	5
Total	381

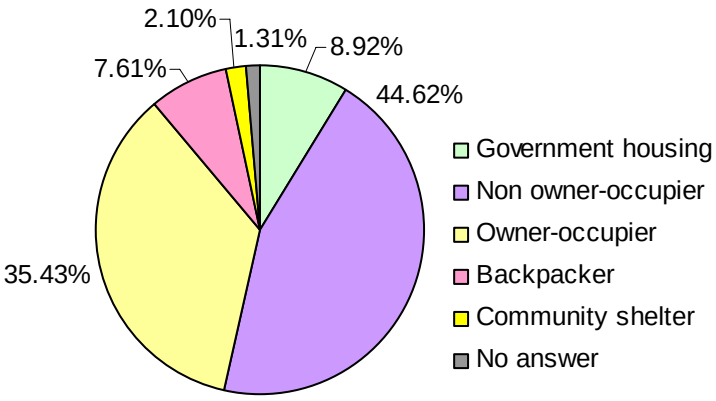


Figure 27. Respondent distribution according to housing tenure type (numbers and percentages).

7.1.4. Question Four: Residential status

Slightly more visitors to, than residents of, Kings Cross were interviewed (see Figure 28). This is contrary to the ratio of residents to visitors in the inner-east on census night (77% to 23% respectively). Less than 1% of the respondents did not answer this part of question 4.

Residency	Count
Resident	185[177]
Visitor	195
No answer	1
Total	381

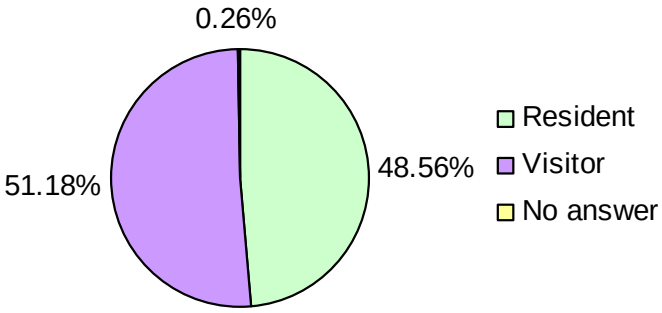


Figure 28. Respondent distribution according to residential status (numbers and percentages).

Of those visitors to Kings Cross who were interviewed, 76% were Australian residents and 22% were visiting from overseas (see Figure 29). Less than 3% percent of the visiting respondents did not answer this part of question 4.

Visitors	Count
Australian resident	148
Overseas resident	42
No answer	5
Total	195

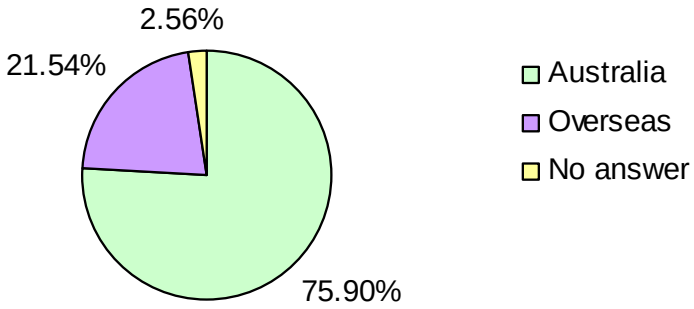


Figure 29. Visitor distribution according to residential status (numbers and percentages).

[177] Nine respondents indicated they were a visitor to Kings Cross, yet indicated their postcode was 2011. These respondents were classed as residents.

Of those residents of Kings Cross who were interviewed, the majority (50%) had resided in the area for more than five years. Of the remainder of the residents, approximately 20% had lived in the area less than 1 year, 10% for one to two years and 15% for three to five years (see Figure 30). Five percent of the respondents who were residents did not answer this part of question 4.

Residents	Count
Less than 1 year	38
1 – 2 years	17
3 – 5 years	27
More than 5 years	93
No answer	10
Total	185

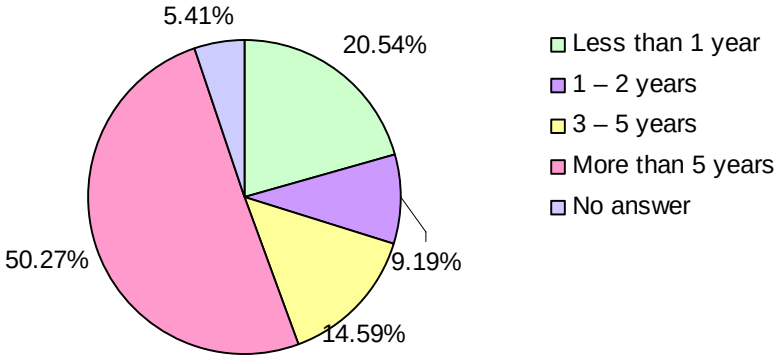


Figure 30. Resident distribution according to residential status (numbers and percentages).

7.1.5. Question Five: Experience of victimisation

The majority of respondents had not been a victim of crime in the 12-month period prior to interviewing (66%) (see Figure 31). Thirty-five percent of the respondents had been a victim of crime. Of these respondents, their experience of victimisations had comprised of attack or assault (27%), threats of force or violence (19%), theft or attempted theft (32%) and damage to property (20%). Only 2% had been a victim of a crime involving the use of a weapon.

Victimsation	Count
Use of a weapon	3
Attack or assault	35
Threats force/violence	25
Theft / attempted theft	42
Damage to property	26
Not applicable	250
Total	381

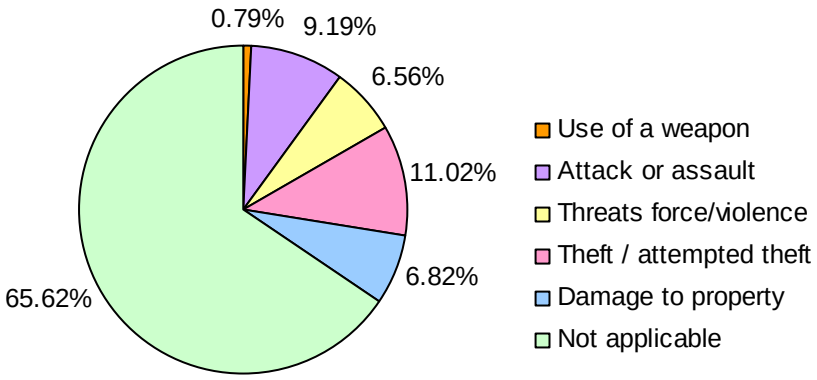


Figure 31a. Respondent distribution according to experience of victimisation (numbers and percentages).

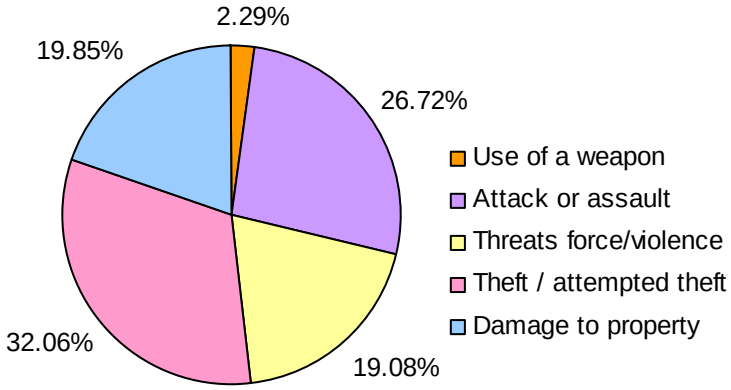


Figure 31b. Distribution of those respondents who had been victimised, according to experience of victimisation.

7.1.6. Question Six: Reporting crime

The majority of respondents had not ever been a victim of crime in Kings Cross (64%). Twenty percent of the respondents who had been a victim of crime in Kings Cross reported that crime to the police (see Figure 32).

Reporting	Count
Yes	77
No	59
Not applicable	245
Total	381

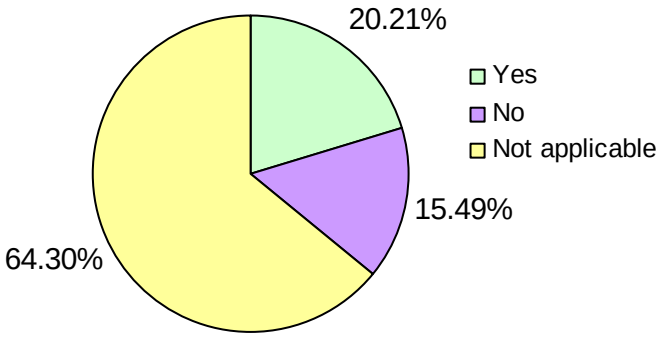


Figure 32. Respondent distribution according to experience of victimisation of crime in Kings Cross and reporting that crime to the police (numbers and percentages).

7.1.7. Question Seven: Social integration

The majority of respondents (85%) indicated they thought that they or their neighbours would call the police if they saw someone being assaulted in Kings Cross. Only 10% answered negatively and 6% did not answer question 7 (see Figure 33).

Community	Count
Yes	322
No	38
No answer	21
Total	381

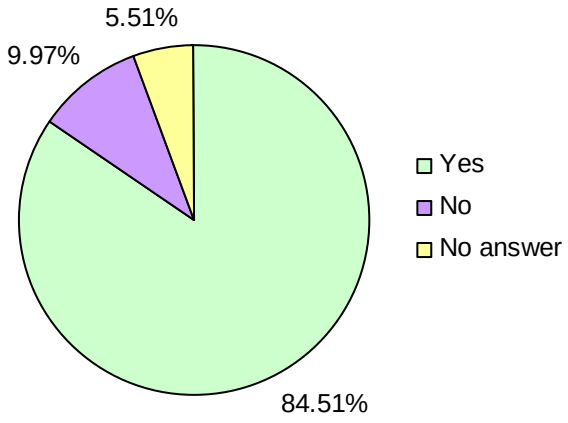


Figure 33. Respondent distribution according to whether they or their neighbours would call the police if they witnessed an assault (numbers and percentages).

7.1.8. Question Eight: Confidence in the police

Sixty-four percent of the respondents indicated they were either ‘very confident’ or ‘quite confident’ in the police. Only 18% of the respondents were ‘not very confident’ or ‘not confident at all’ in the police (see Figure 34).

Confidence	Count
Very confident	107
Quite confident	136
Don’t know	70
Not very confident	52
Not confident at all	15
No answer	1
Total	381

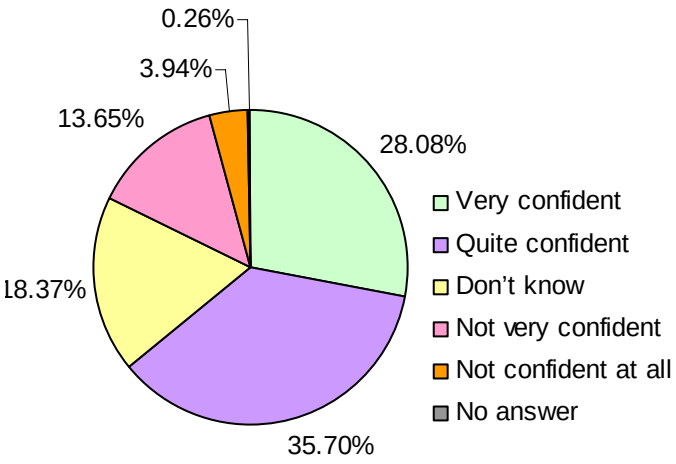


Figure 34. Respondent distribution according to their confidence in obtaining Police assistance in a crime-related emergency (numbers and percentages).

7.1.9. Question Nine: Fearfulness using a global measurement approach

Thirty-five percent of the respondents indicated that they have not felt fearful or afraid when walking in Kings Cross. The remaining 64% had felt fear, while only 1% of the respondents did not answer question 9 (see Figure 35). This is consistent with Darcy's (2003) finding that 62% of the respondents in his sample had felt 'unsafe' in Kings Cross.

Fearful	Count
Yes	133
No	244
No answer	4
Total	381

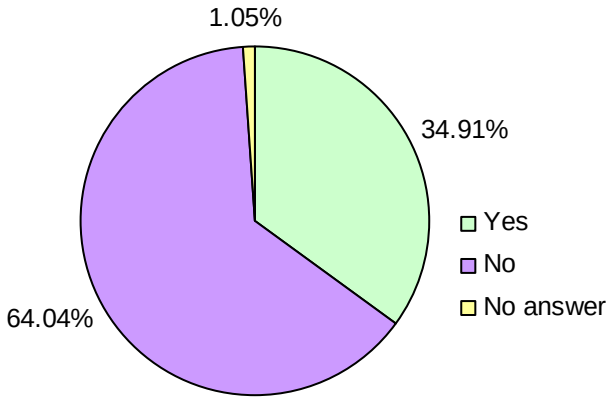


Figure 35. Respondent distribution according to global fear (numbers and percentages).

7.1.10. Question Ten: Income

A large proportion of respondents fell into the lowest income category (28%, see Figure 36). The two middle income categories comprised of 55% of the respondents, while less than 10% of respondents where in the top income bracket. This result is very different to typically high income levels earned by inner-east residents (for example 4% and 21% in the lowest and highest income categories respectively). The result is more consistent with the income levels earned by residents of greater Sydney. Eight percent of the respondents did not to answer question 10.

Income	Count
$0 - $15,599	106
$15,600 - $41,599	120
$41,600 - $77,999	92
$78,000 or more	33
No answer	30
Total	381

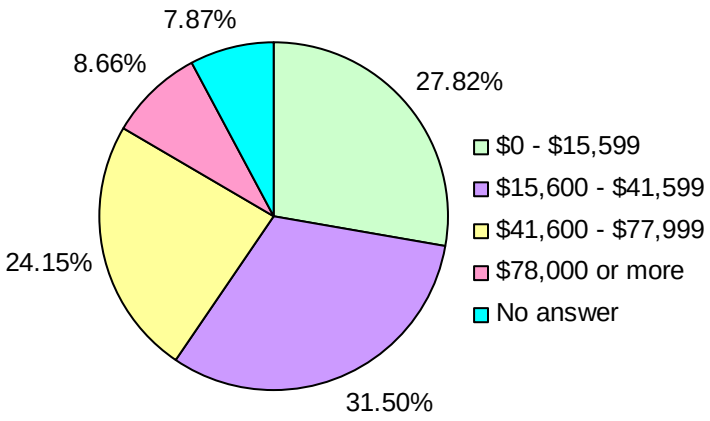


Figure 36. Respondent distribution according to annual income (numbers and percentages).

The results from the ten general 'tick and flick' questions, looking at socio-demographic characteristics of the study sample, are presented above. Next are the results from the survey's mapping question, question 11, which was designed to obtain the spatial fear of crime data.

7.2. Mapping section: Crime-specific avoidance-based questions

This section displays the answers provided by the survey respondents in response to the questions:

- “Do you avoid any areas, shown on this map of Kings Cross, because you are afraid of being robbed beaten or attacked?”;
- “How hard do you try to avoid those areas”; and
- “In each area you avoid, which of these factors, if any, trigger you to feel fearful of being robbed, beaten or attacked?”

The results from these questions are presented in the order of the above list. They appear under the headings ‘occurrence of avoidance’, ‘degree of avoidance hardness’ and ‘environmental cues triggering fear of crime’.

7.2.1. Question 11 (Part A): Occurrence of avoidance

Thirty-six percent of the respondents indicated that they avoided areas in the Kings Cross study area because they were afraid of being robbed, beaten or attacked in the day (see Figure 37). This proportion of the respondents increased to 66% in the night (see Figure 38).

Avoidance	Count
Yes	138
No	243
Total	381
Avoidance	**Count**

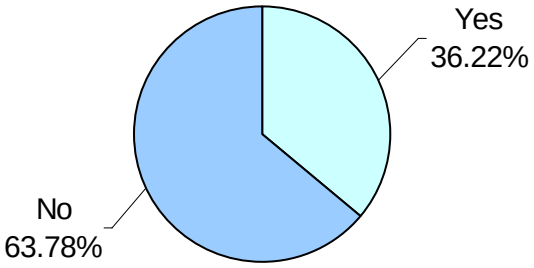


Figure 37. Number and percentage of respondents avoiding areas in the DAY.

Avoidance	Count
Yes	252
No	129
Total	381

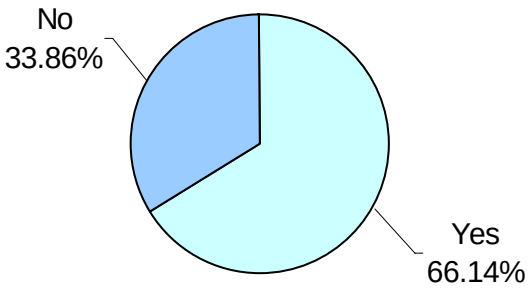


Figure 38. Number and percentage of respondents avoiding areas in the NIGHT.

Results from a chi-square analysis show that only one (the respondent's sex) of the five socio-demographic variables was associated with fear of crime and avoidance during the day and night (see Table 10 on the following page).

Table 10. Chi-square analysis of socio-demographic variables and fear of crime.

Socio-demographic variable	***Percent feeling unsafe or afraid (Question 9)***	***Percent adopting avoidance during the day***	***Percent adopting avoidance during the night***
Sex	p = 0.0057	p = 0.0001	p = 0.0001
Male	*28.86*[178]	*25.37*	*62.77*
Female	*42.53*	*44.89*	*82.1*
Age (over 18 years)	p = 0.0526	p = 0.2712	p = 0.1031
18-29	*42.11*	*29.82*	*69.03*
30-59	*36.00*	*40.34*	*71.93*
60+	*25.58*	*29.89*	*57.47*
Housing tenure	p = 0.3689	p = 0.6242	p = 0.3162
Government housing	*50.00*	*26.47*	*55.88*
Non owner-occupier	*35.33*	*37.5*	*71.08*
Owner-occupier	*31.11*	*35.56*	*68.94*
Backpacker	*34.48*	*31.03*	*57.14*
Community shelter	*37.5*	*12.5*	*62.5*
Residential status	p = 0.8829	p = 0.1092	p = 0.074
Resident	*35.63*	*40.23*	*73.56*
Visitor	*34.9*	*30.05*	*62.57*
Income (per annum)	p = 0.4864	p = 0.8427	p = 0.0646
$0 - $15,599	*33.02*	*33.02*	*58.49*
$15,600 - $41,599	*41.53*	*37.82*	*76.27*
$41,600 - $77,999	*32.97*	*30.77*	*69.32*
$78,000 or more	*33.33*	*39.39*	*63.64*

The following section shows the extent to which the avoiding respondents tried to avoid the different areas of the study area because they were afraid of crime.

[178] While percentages are shown in this table, note that the chi-square analysis calculations were based on the raw data numbers and not percentages.

7.2.2. Question 11 (Part B): Degree of avoidance hardness

Forty-six percent of the avoiding respondents tried either *very hard* or *quite hard* to avoid the areas in which they were afraid of being robbed, beaten or attacked during the day. This figure increased to fifty-seven percent during the night. Thirty-four percent of the respondents *did not try very hard* or *did not try at all* to avoid those areas during the day. This figure decreased to 30% during the night. For both the day and night, only 4%of respondents *did not know how hard* they tried to avoid those areas. Twenty-two respondents did not answer the question. This accounted for 16% and 9% of the respondents in the day and night respectively (see Figure 39 and Figure 40).

Answer	Count
Very hard	40
Quite hard	24
Don't know	5
Not very hard	30
Not hard at all	17
No answer	22
Total responses	138

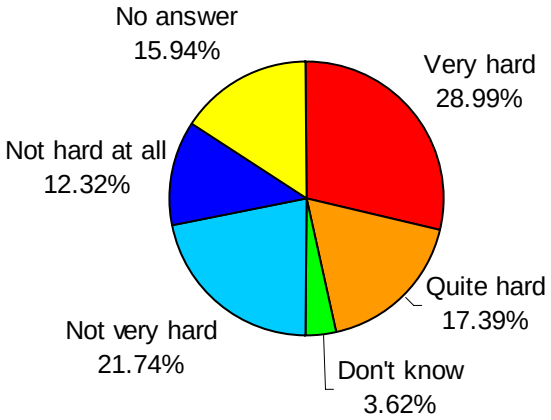


Figure 39. Number and percentage of respondents by degree of avoidance hardness for the DAY.

Answer	Count
Very hard	86
Quite hard	57
Don't know	11
Not very hard	54
Not hard at all	22
No answer	22
Total	252

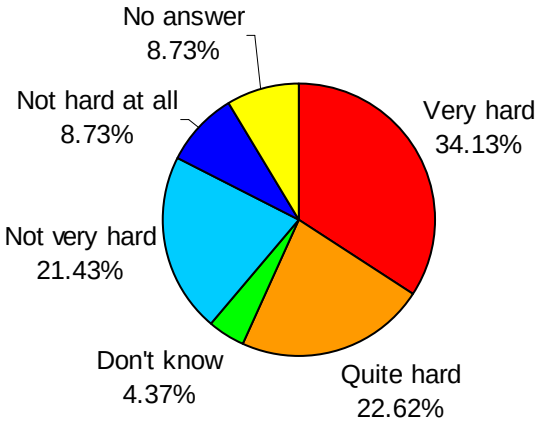


Figure 40. Number and percentage of respondents by degree of 'avoidance hardness for the NIGHT.

The results pertaining to the environmental cues that triggered the respondent's fear of crime now follow the 'degree of avoidance hardness' results.

7.2.3. Question 11 (Part C): Environmental cues triggering fear of crime

This section shows the percentage of avoiding respondents who stated their fear of crime was triggered by each of the environmental cues examined in this study. Results for the eight social cues are presented first, followed by those for the eight physical environmental cues.

7.2.3.1. Drug users

Sixty-four percent[179] of the respondents who avoided areas, indicated that the presence of drug users was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 41 and Figure 42).[180]

Drug users	Count
Yes	88
No	50
Total	138

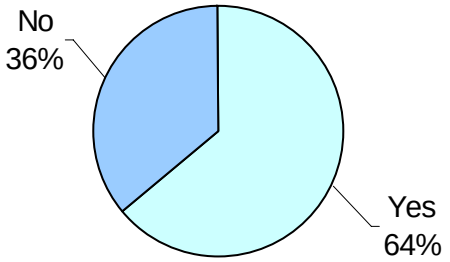


Figure 41. Number and percentage of respondents who stated the presence of *drug users* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Drug users	Count
Yes	162
No	43
Total	252

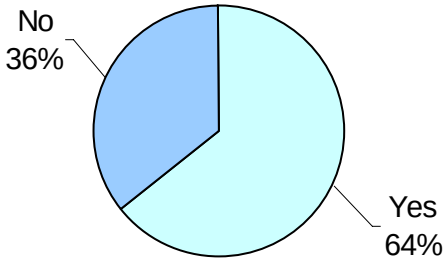


Figure 42. Number and percentage of respondents who stated the presence of *drug users* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[179] Note that these results can not be compared with those obtained from Darcy's (2003) study. The percentages used in Darcy's study reflect the proportion of *all respondents* who stated the environmental cues made them *feel unsafe*. These percentages reflect the proportion of *avoiding respondents* who stated the environmental cues made them feel *afraid of being robbed, beaten or attacked*.

[180] This is equivalent to 23% (day) and 42.5% (night) of all of the surveyrespondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.2. Spruikers

Twenty-two percent (day) and 25% (night) of the respondents who avoided areas, indicated that the presence of spruikers was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 43 and Figure 44).[181]

Spruikers	Count
Yes	30
No	108
Total	138

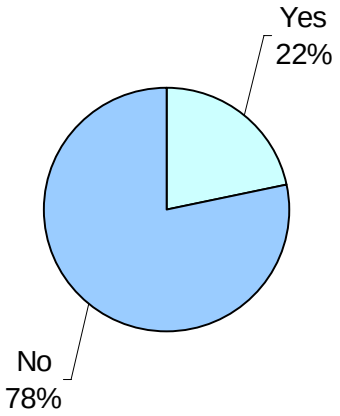


Figure 43. Number and percentage of respondents who stated the presence of *spruikers* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Spruikers	Count
Yes	62
No	190
Total	252

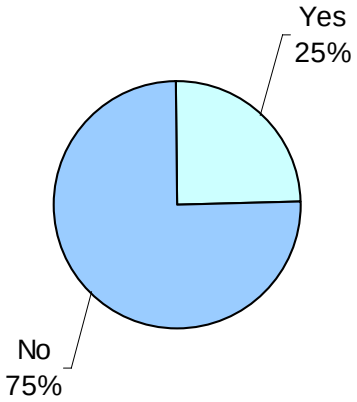


Figure 44. Number and percentage of respondents who stated the presence of *spruikers* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[181] This is equivalent to 7.9% (day) and 16.3% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.3. Homeless

Thirty-three percent (day) and 31% (night) of the respondents who avoided areas, indicated that the presence of homeless people was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 45 and Figure 46).[182]

Homeless	**Count**
Yes	45
No	93
Total	138

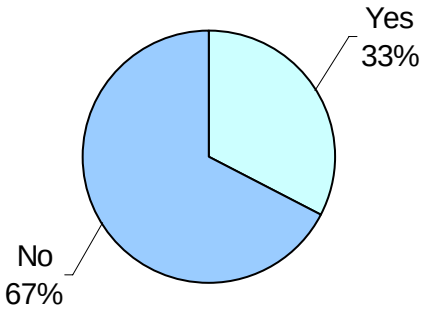


Figure 45. Number and percentage of respondents who stated the presence of *homeless* people was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Homeless	**Count**
Yes	77
No	175
Total	252

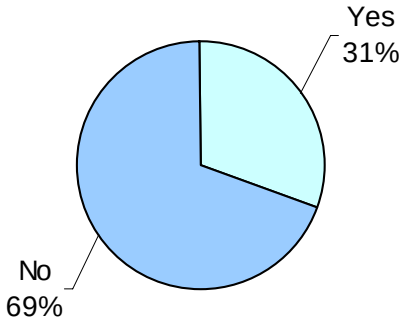


Figure 46. Number and percentage of respondents who stated the presence of *homeless* people was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[182] This is equivalent to 11.8% (day) and 20.2% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.4. Intoxicated persons

Fifty-four percent (day) and 55% (night) of the respondents who avoided areas, indicated that the presence of intoxicated persons was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 47 and Figure 48).[183]

Intoxicated persons	Count
Yes	74
No	64
Total	138

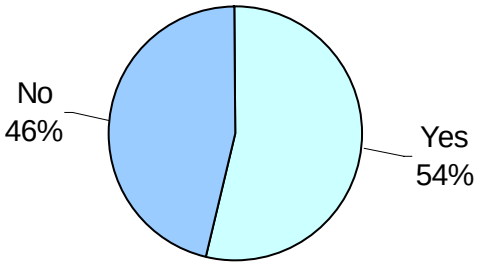


Figure 47. Number and percentage of respondents who stated the presence of *intoxicated persons* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Intoxicated persons	Count
Yes	139
No	113
Total	252

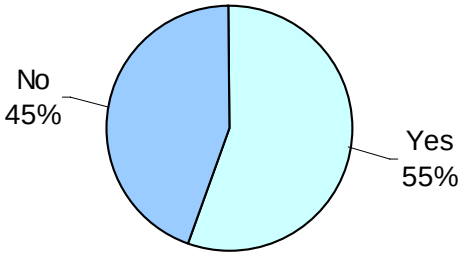


Figure 48. Number and percentage of respondents who stated the presence of *intoxicated persons* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[183] This is equivalent to 19.4% (day) and 36.5% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.5. Sex workers

Seventeen percent (day) and 20% (night) of the respondents who avoided areas, indicated that the presence of sex workers was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 49 and Figure 50).[184]

Sex workers	Count
Yes	24
No	114
Total	138

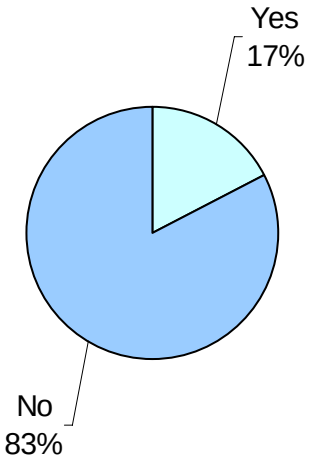


Figure 49. Number and percentage of respondents who stated the presence of *sex workers* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Sex workers	Count
Yes	50
No	202
Total	252

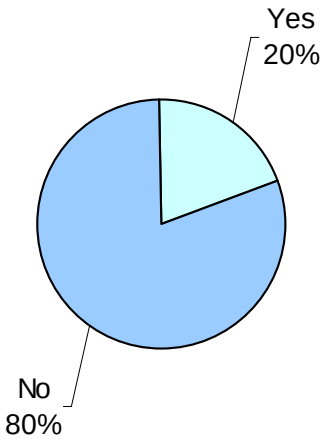


Figure 50. Number and percentage of respondents who stated the presence of *sex workers* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[184] This is equivalent to 16.3% (day) and 13.1% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.6. Gangs

Fifty-seven percent (day) and 56% (night) of the respondents who avoided areas, indicated that the presence of gangs was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 51 and Figure 52).[185]

Gangs	Count
Yes	78
No	60
Total	138

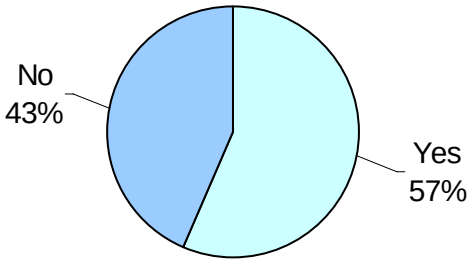


Figure 51. Number and percentage of respondents who stated the presence of *gangs* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Gangs	Count
Yes	142
No	110
Total	252

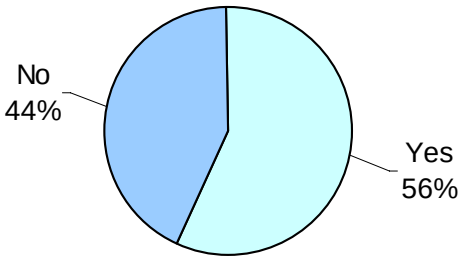


Figure 52. Number and percentage of respondents who stated the presence of *gangs* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[185] This is equivalent to 20.5% (day) and 37.3% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.7. Loitering persons

Forty-three percent (day) and 46% (night) of the respondents who avoided areas, indicated that the presence of loitering persons was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 53 and Figure 54).[186]

Loitering persons	Count
Yes	59
No	79
Total	138

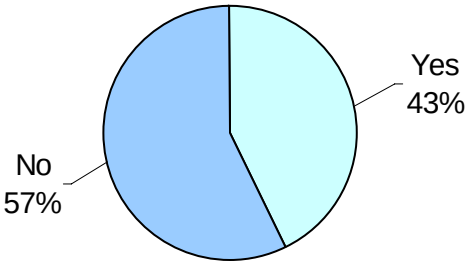


Figure 53. Number and percentage of respondents who stated the presence of *loitering persons* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Loitering persons	Count
Yes	115
No	137
Total	252

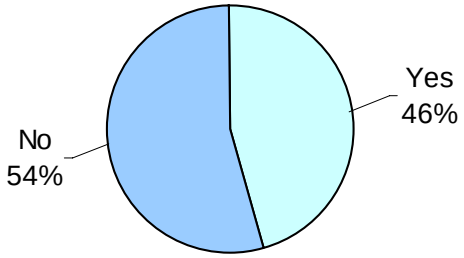


Figure 54. Number and percentage of respondents who stated the presence of *loitering persons* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[186] This is equivalent to 11.8% (day) and 20.2% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.8. Pedestrian absence

Thirty-three percent (day) and 37% (night) of the respondents who avoided areas, indicated that the absence of pedestrians was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 55 and Figure 56).[187]

Pedestrian absence	Count
Yes	46
No	92
Total	138

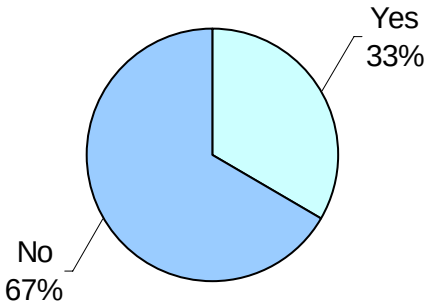


Figure 55. Number and percentage of respondents who stated p*edestrian absence* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Pedestrian absence	Count
Yes	92
No	160
Total	252

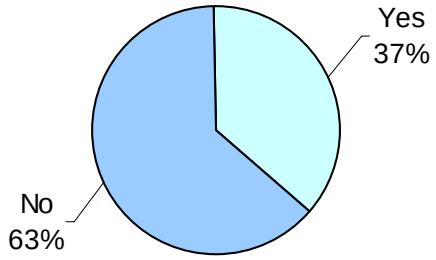


Figure 56. Number and percentage of respondents who stated p*edestrian absence* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[187] This is equivalent to 12.1% (day) and 24.1% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.9. Poor street lighting

Thirty-six percent (day) and 52% (night) of the respondents who avoided areas, indicated that poor street lighting was a factor in triggering their fear of being robbed, beaten or attacked in the day (see Figure 57 and Figure 58).[188]

Poor street lighting	Count
Yes	49
No	89
Total	138

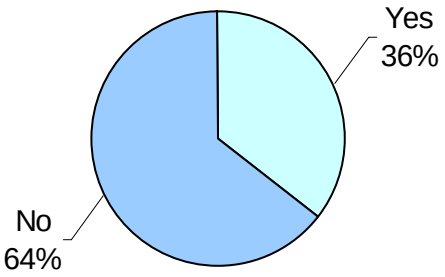


Figure 57. Number and percentage of respondents who stated *poor street lighting* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Poor street lighting	Count
Yes	132
No	120
Total	252

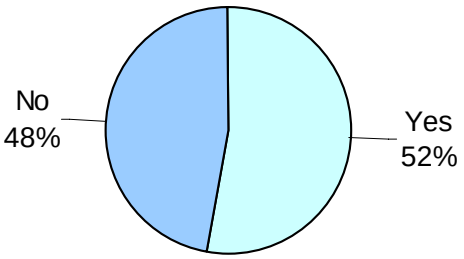


Figure 58. Number and percentage of respondents who stated *poor street lighting* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[188] This is equivalent to 12.9% (day) and 34.6% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.10. Vandalism

Twenty-five percent (day) and 29% (night) of the respondents who avoided areas, indicated that the presence of vandalism was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 59 and Figure 60).[189]

Vandalism	Count
Yes	34
No	104
Total	138

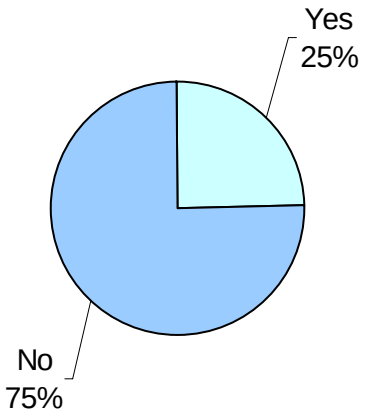


Figure 59. Number and percentage of respondents who stated the presence of *vandalism* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Vandalism	Count
Yes	72
No	180
Total	252

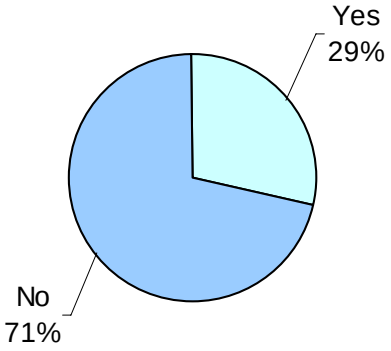


Figure 60. Number and percentage of respondents who stated the presence of *vandalism* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[189] This is equivalent to 8.9% (day) and 18.9% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.11. Rubbish / syringes

Forty-four percent (day) and 48% (night) of the respondents who avoided areas, indicated that the presence of rubbish and syringes was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 61 and Figure 62).[190]

Rubbish / syringes	**Count**
Yes	61
No	77
Total	138

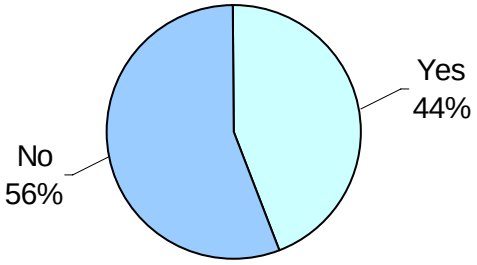


Figure 61. Number and percentage of respondents who stated the presence of *rubbish / syringes* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Rubbish / syringes	**Count**
Yes	122
No	130
Total	252

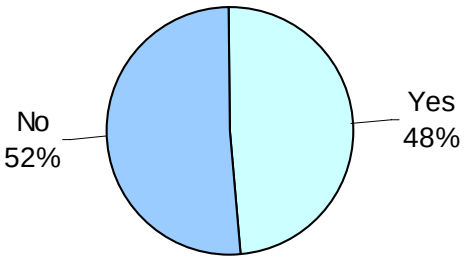


Figure 62. Number and percentage of respondents who stated the presence of *rubbish / syringes* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[190] This is equivalent to 16.0% (day) and 32.0% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.12. Rundown / abandoned buildings

Twenty-five percent (day) and 32% (night) of the respondents who avoided areas, indicated that the presence of rundown / abandoned buildings was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 63 and Figure 64).[191]

Rundown / Abandoned buildings	**Count**
Yes	35
No	103
Total	138

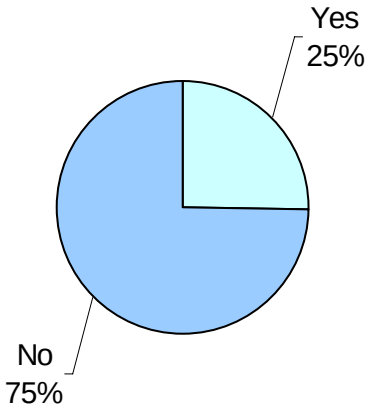


Figure 63. Number and percentage of respondents who stated the presence of *rundown / abandoned buildings* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Rundown / Abandoned buildings	**Count**
Yes	81
No	171
Total	252

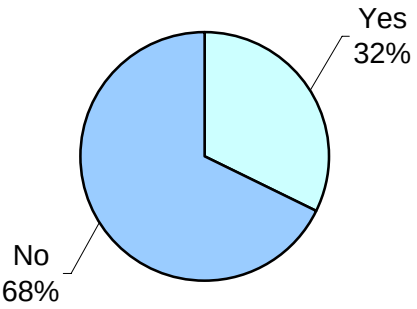


Figure 64. Number and percentage of respondents who stated the presence of *rundown / abandoned buildings* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[191] This is equivalent to 9.2% (day) and 21.3% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.13. Offensive / degraded shops

Twenty-one percent (day) and 25% (night) of the respondents who avoided areas, indicated that the presence of offensive / degraded shops were a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 65 and Figure 66).[192]

Offensive / Degraded shops	**Count**
Yes	29
No	109
Total	138

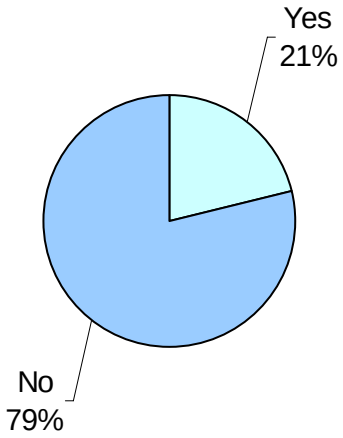


Figure 65. Number and percentage of respondents who stated the presence of *offensive / degraded shops* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Offensive / Degraded shops	**Count**
Yes	64
No	188
Total	252

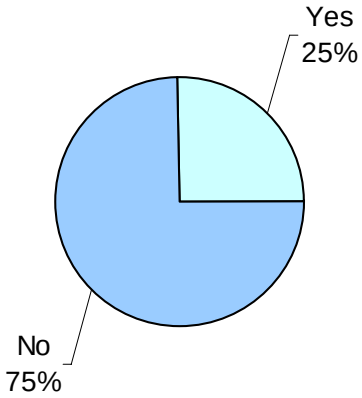


Figure 66. Number and percentage of respondents who stated the presence of *offensive / degraded shops* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[192] This is equivalent to 7.6% (day) and 16.8% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.14. Areas to hide

Thirty-nine percent (day) and 42% (night) of the respondents who avoided areas, indicated that the presence of areas to hide was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 67 and Figure 68).[193]

Areas to hide	Count
Yes	54
No	84
Total	138

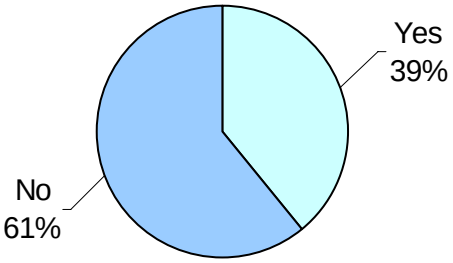


Figure 67. Number and percentage of respondents who stated the presence of *areas to hide* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Areas to hide	Count
Yes	107
No	145
Total	252

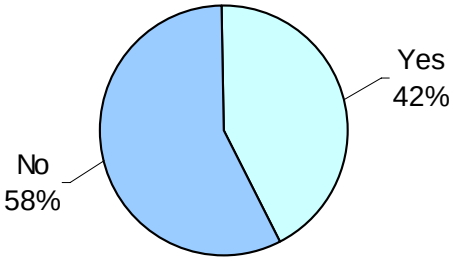


Figure 68. Number and percentage of respondents who stated the presence of *areas to hide* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[193] This is equivalent to 14.2% (day) and 28.1% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.15. Blocked escape

Thirty-five percent (day) and 36% (night) of the respondents who avoided areas, indicated that the presence of blocked escape was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 69 and Figure 70).[194]

Blocked escape	Count
Yes	48
No	90
Total	138

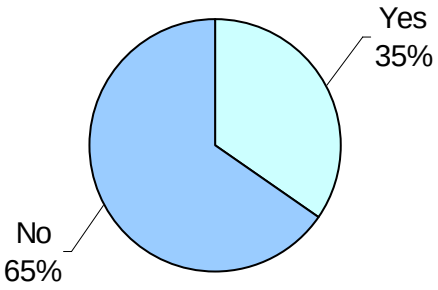


Figure 69. Number and percentage of respondents who stated the presence of *blocked escape* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Blocked escape	Count
Yes	90
No	162
Total	252

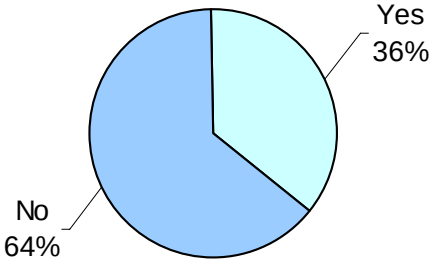


Figure 70. Number and percentage of respondents who stated the presence of *blocked escape* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

[194] This is equivalent to 12.6% (day) and 23.6% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

7.2.3.16. Laneways

Forty-five percent (day) and 50% (night) of the respondents who avoided areas, indicated that the presence of laneways was a factor in triggering their fear of being robbed, beaten or attacked in the day and the night (see Figure 71 and Figure 72).[195]

Laneways	Count
Yes	62
No	76
Total	138

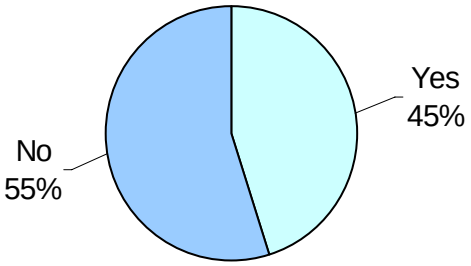


Figure 71. Number and percentage of respondents who stated the presence of *laneways* was a factor in triggering their fear of being robbed, beaten or attacked in the DAY.

Laneways	Count
Yes	125
No	127
Total	252

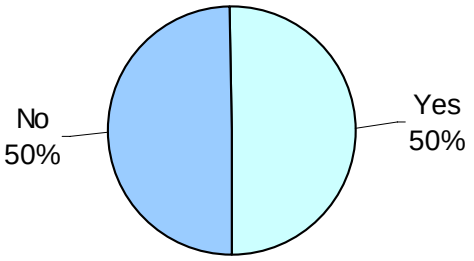


Figure 72. Number and percentage of respondents who stated the presence of *laneways* was a factor in triggering their fear of being robbed, beaten or attacked in the NIGHT.

7.3. Summary of sample characteristics

This chapter presented the general survey results, the sample characteristics. It firstly included results relating to the demographic characteristics of the sample. It subsequently looked at the non-spatial component of question 11, which concluded with the percent-based results pertaining to each environmental cue. The following two results chapters present the 2D and 3D avoidance maps resulting from the spatial visualisation of this data.

[195] This is equivalent to 16.3% (day) and 32.8% (night) of all of the survey respondents, regardless of whether they did or did not feel afraid of crime and adopt avoidance behaviour.

8. Results: The 2D avoidance maps

This chapter begins to present the spatial survey data relating to respondent avoidance due to the different environmental cues triggering their fear of crime. Selected results from the 2D avoidance density and avoidance hardness maps for the environmental cues are provided. These maps use different spatial visualisation methods to map the fear of crime data shown in the previous results chapter. However, firstly a comment on the data processing procedures is given.

8.1. The data processing procedures

During the geometric transformation process a root mean square (RMS) error is calculated for each rectified TIFF image. This indicates how well the destination control points match the transformed locations of the source control points (ESRI, 2004). The maximum RMS for any of the maps was 0.00004, a minor amount producing undetectable distortions in the production of the avoidance maps.

8.2. The 2D avoidance density and avoidance hardness maps

This section presents the 2D avoidance density and avoidance hardness maps. Four different avoidance density maps are displayed, each using a different method to classify the avoidance density data. The 2D avoidance density and avoidance hardness maps for two of the 14 environmental cues, drug users and sex workers, are presented in this section. The maps for the 14 other environmental cues are shown in Appendix B.

8.2.1. Avoidance density maps showing percentage of avoiding respondents

The results from the first method to classify the avoidance density data are shown here. These avoidance density maps show the percentage of respondents that avoided each area of the study site (because each environmental cue triggered their fear of crime). The percentage is taken from the total number of avoiding respondents during the day (138) and night (252). These maps were used to create the population percentile bands for the 3D avoidance maps. These maps are briefly described and interpreted in the following chapter.

Figure 73. Areas where the survey respondents stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 74. Areas where the survey respondents stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

8.2.2. Avoidance density maps used to rank the environmental cues

The results from the second method to classify the avoidance density data are shown here. The method of data classification used to produce these avoidance density maps was employed to help rank the environmental cues according to the number of respondents avoiding each area of the study site (because the environmental cue in question triggered their fear of crime). These maps display the avoidance density data using stretched symbology with a maximum value of 40 for the day maps and 80 for the night maps. These maps are briefly described and interpreted in the following chapter.

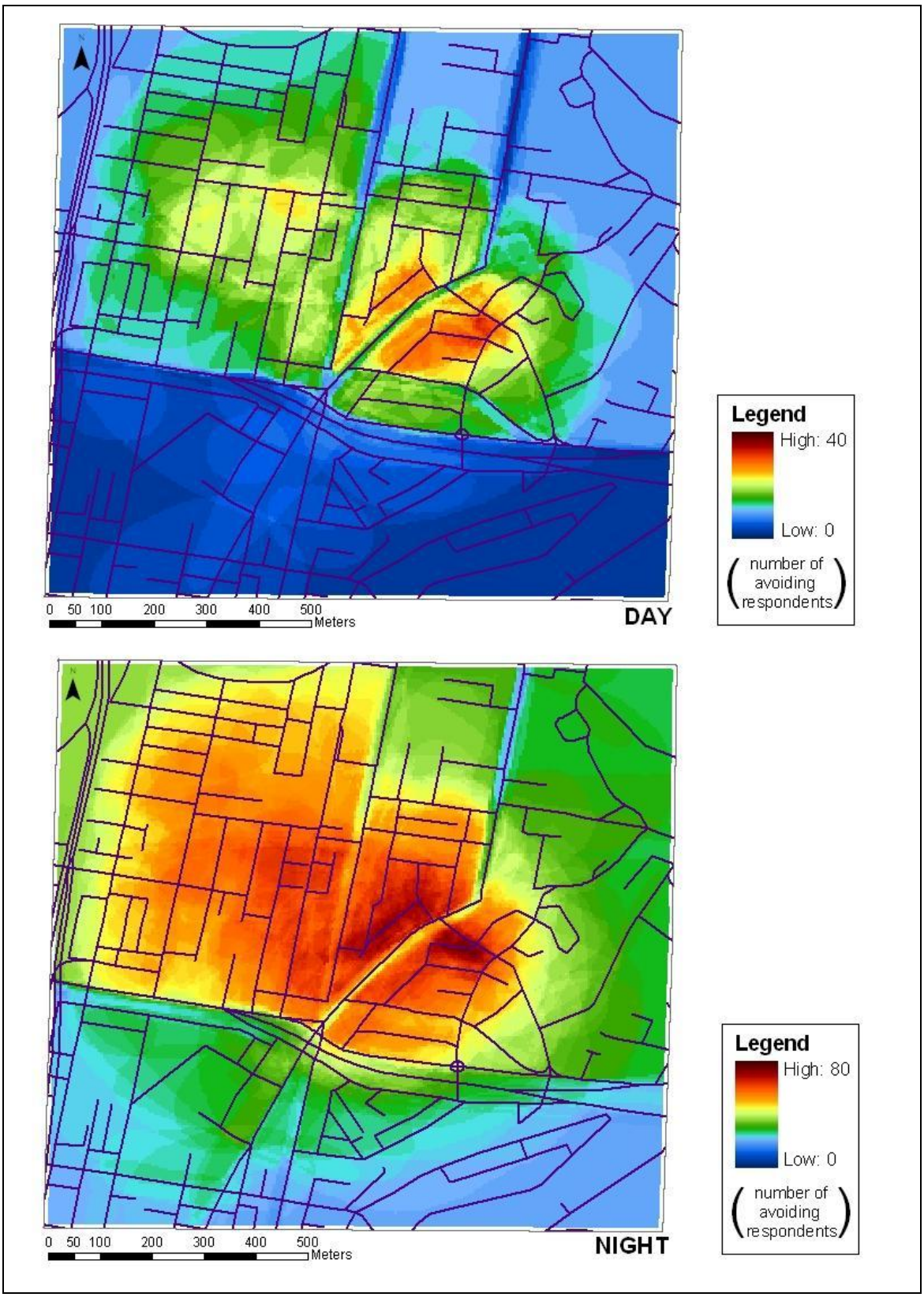


Figure 75. Areas where the survey respondents stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

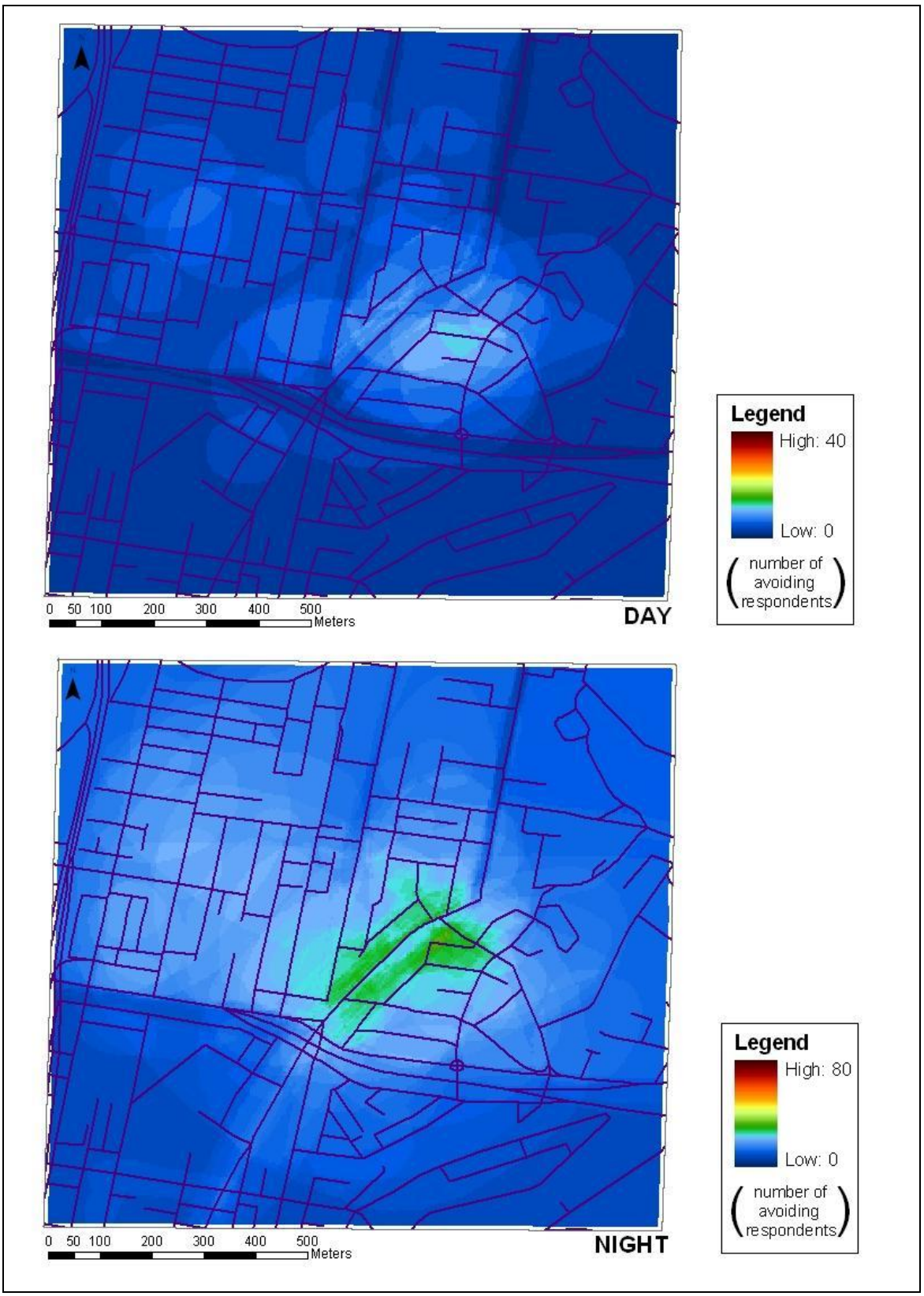


Figure 76. Areas where the survey respondents stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

8.2.3. Avoidance density maps used to highlight temporal changes in avoidance

The results from the third method to classify the avoidance density data are shown here. The method of data classification used to produce these avoidance density maps facilitates the illustration of temporal changes between the number of respondents avoiding each area (of the study site because the environmental cue in question triggered their fear of crime) in the day and night. The avoidance density data is classified into groups of two avoiding respondents. The same legend was applied to all maps, both day and night, enabling comparison between the day and night maps for each of the environmental cues. These maps are briefly described and interpreted in the following chapter.

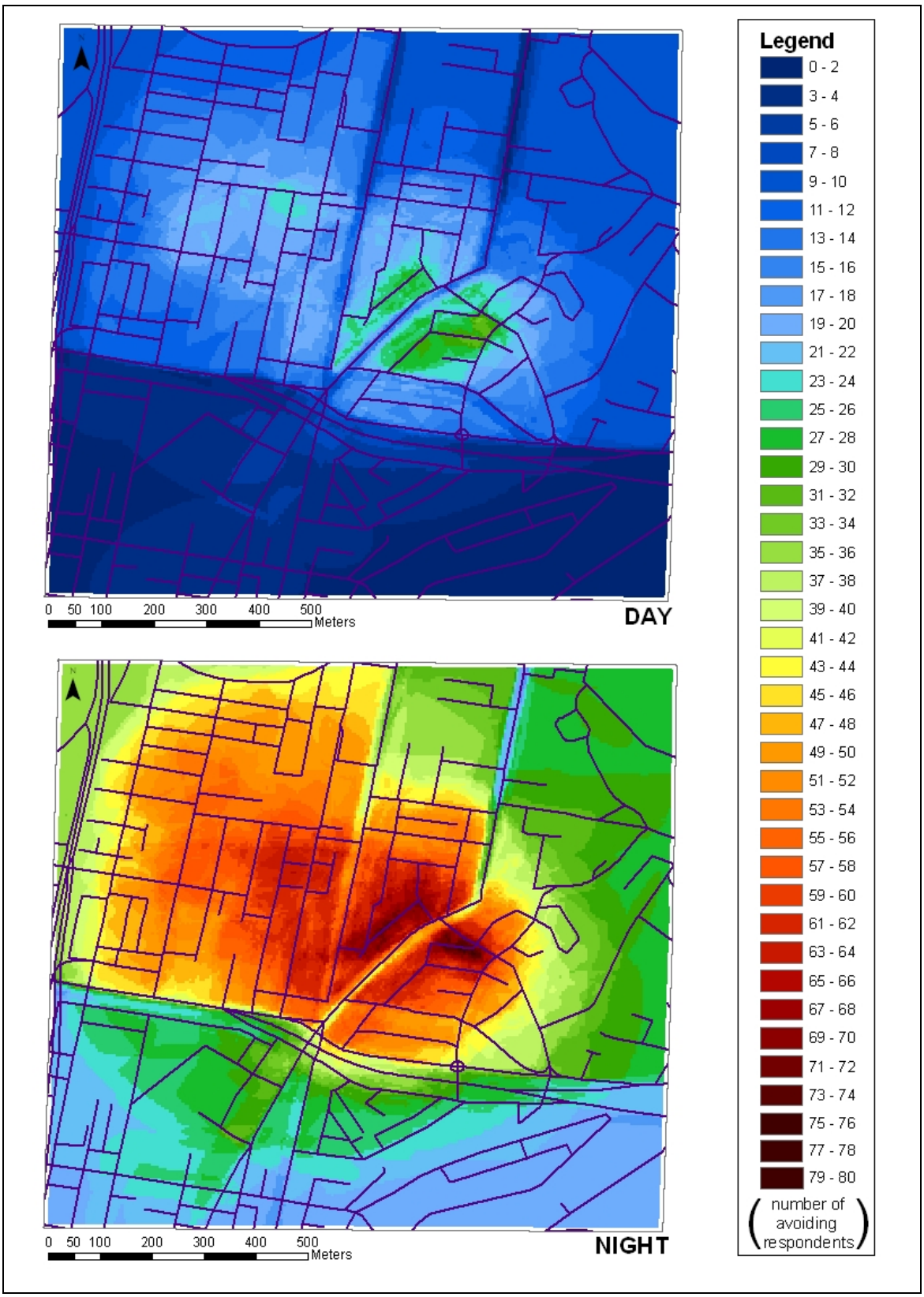


Figure 77. Areas where the survey respondents stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate avoidance data for each area is categorised into classes of two.

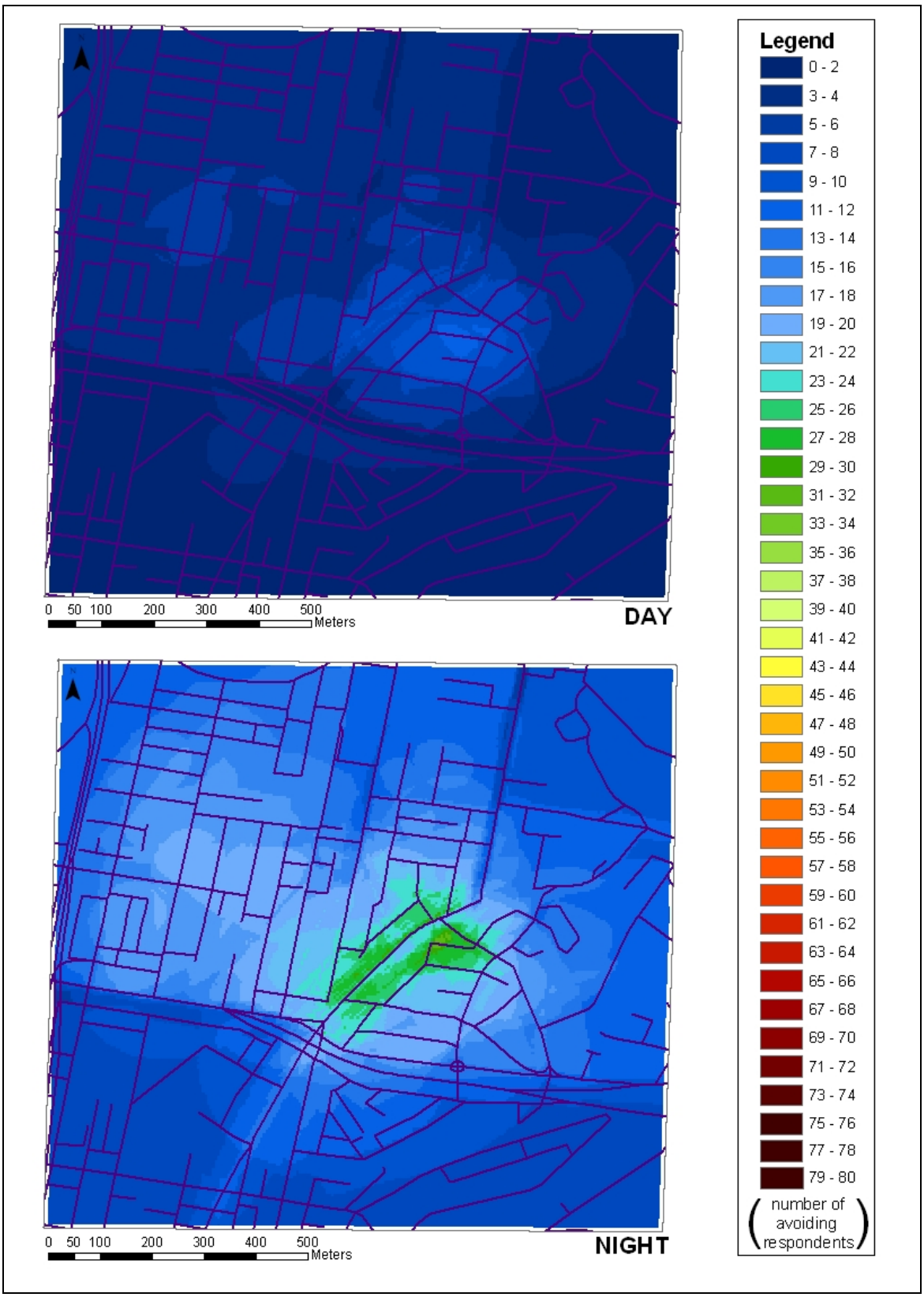


Figure 78. Areas where the survey respondents stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate avoidance data for each area is categorised into classes of two.

8.2.4. Avoidance density maps used to identify areal differences in avoidance

The results from the fourth method to classify the avoidance density data are shown here. The method of data classification used to produce these avoidance density maps helps identify areal differences in the patterns of avoidance triggered by each environmental cue. These maps displayed the avoidance density data using stretched symbology with a varying maximum value for each map. These maps are briefly described and interpreted in the following chapter.

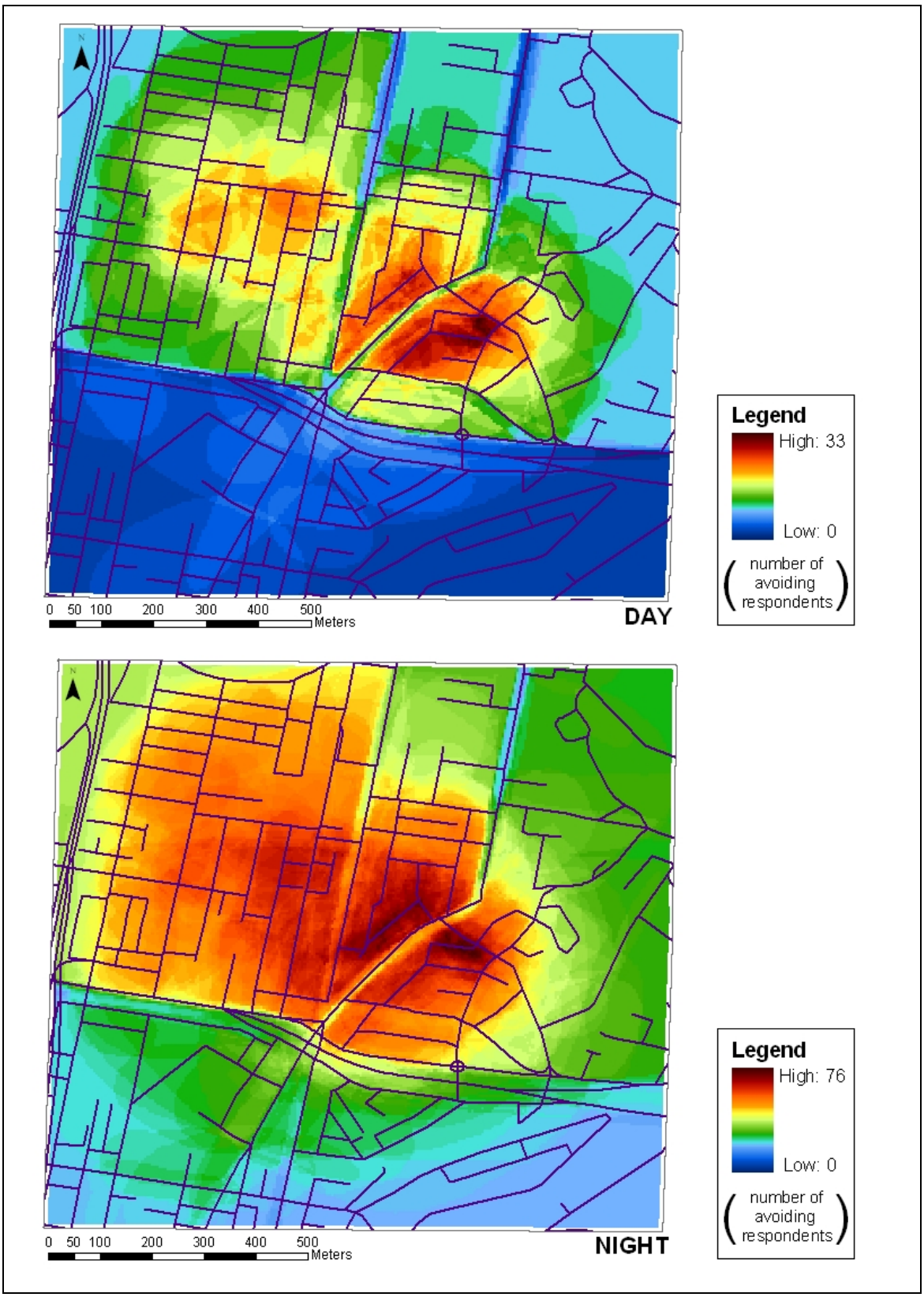


Figure 79. Areas where the survey respondents stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

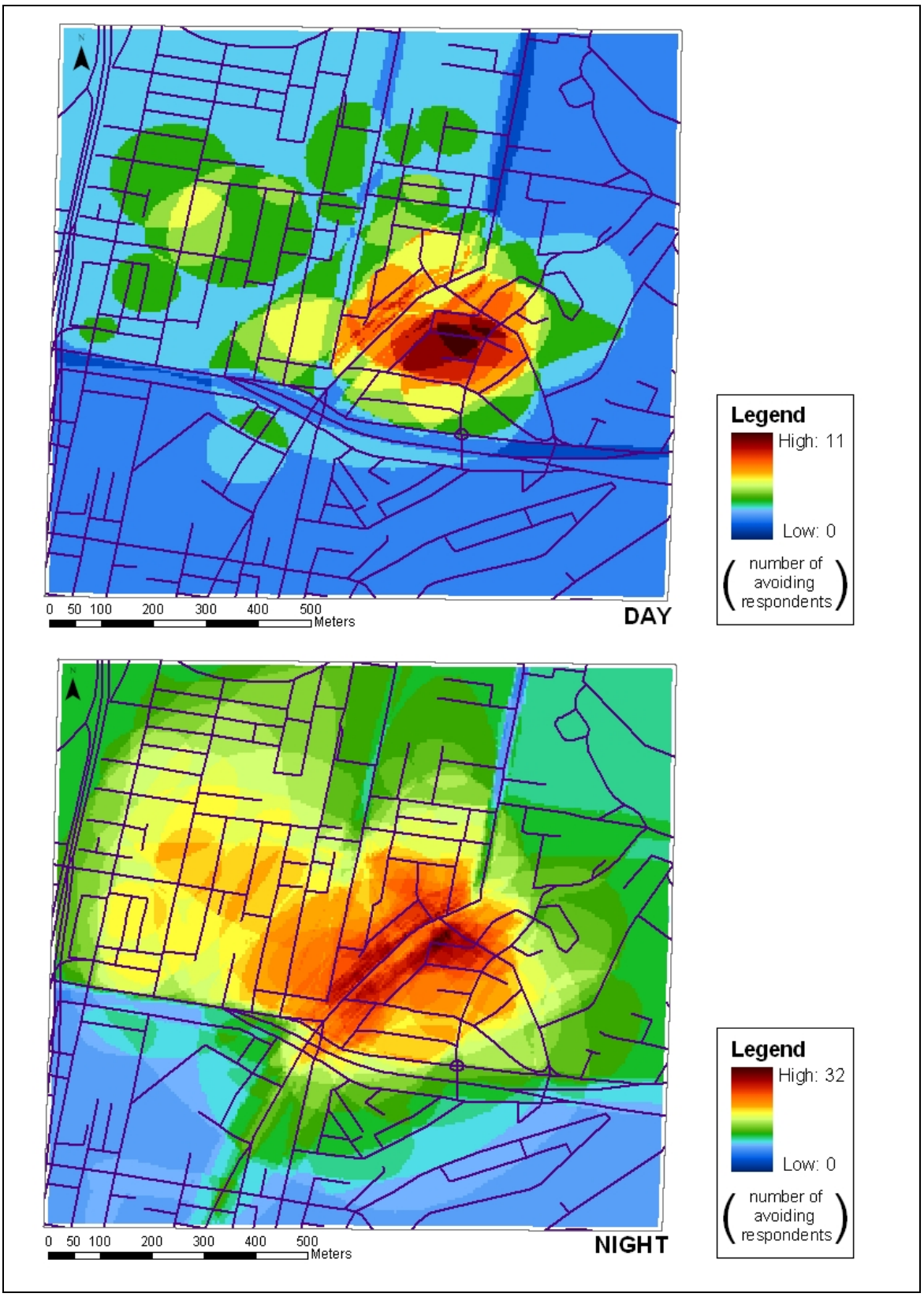


Figure 80. Areas where the survey respondents stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

8.2.5. Avoidance hardness maps

This section presents the 2D avoidance hardness maps, showing the average ‘avoidance hardness’ for areas where the survey respondents stated the different environmental cues triggered their fear of being robbed, beaten or attacked – during the day and night. These maps are briefly described and interpreted in the following chapter.

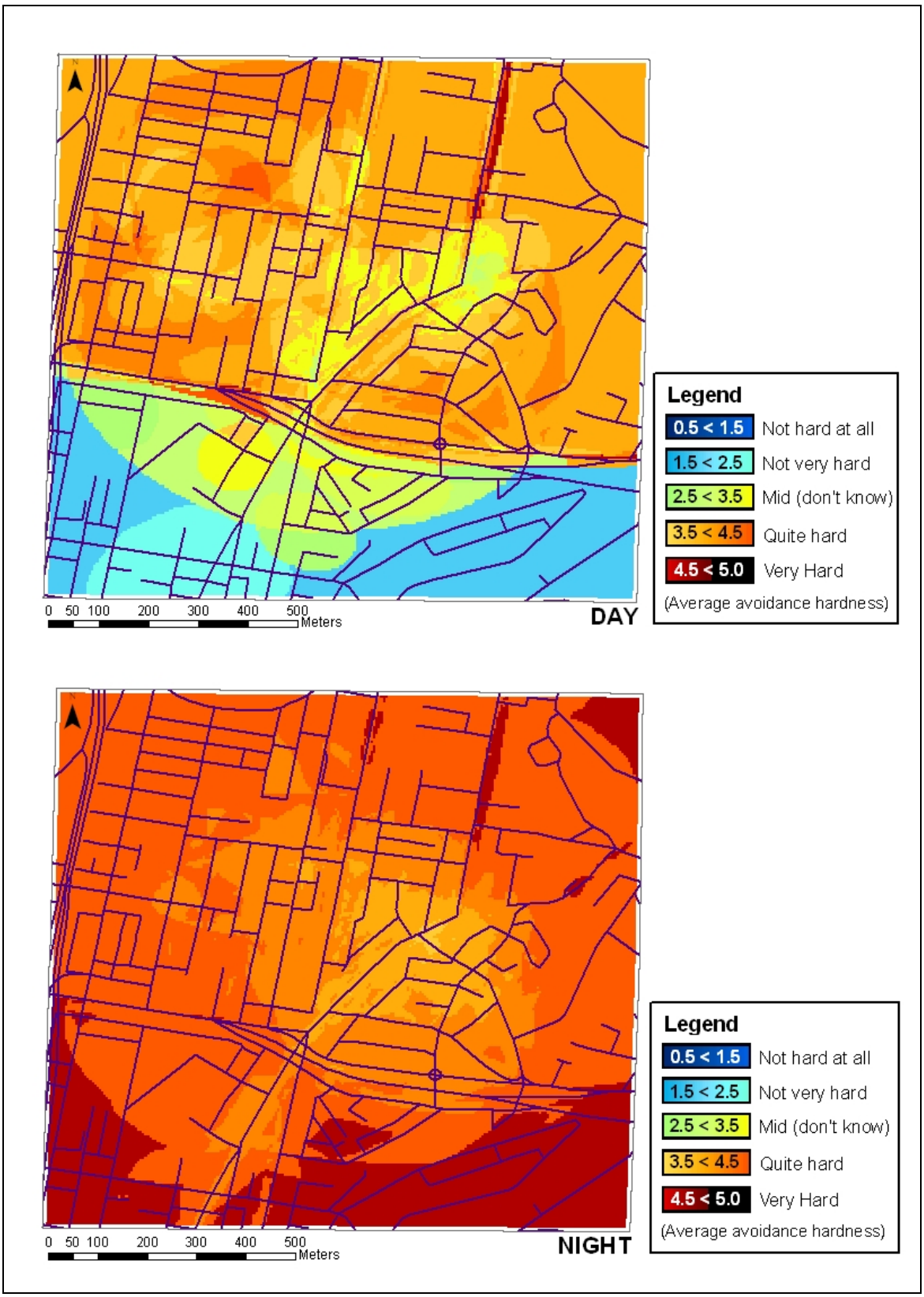


Figure 81. Average degree of avoidance hardness for areas where the survey respondents stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked – during the day and night.

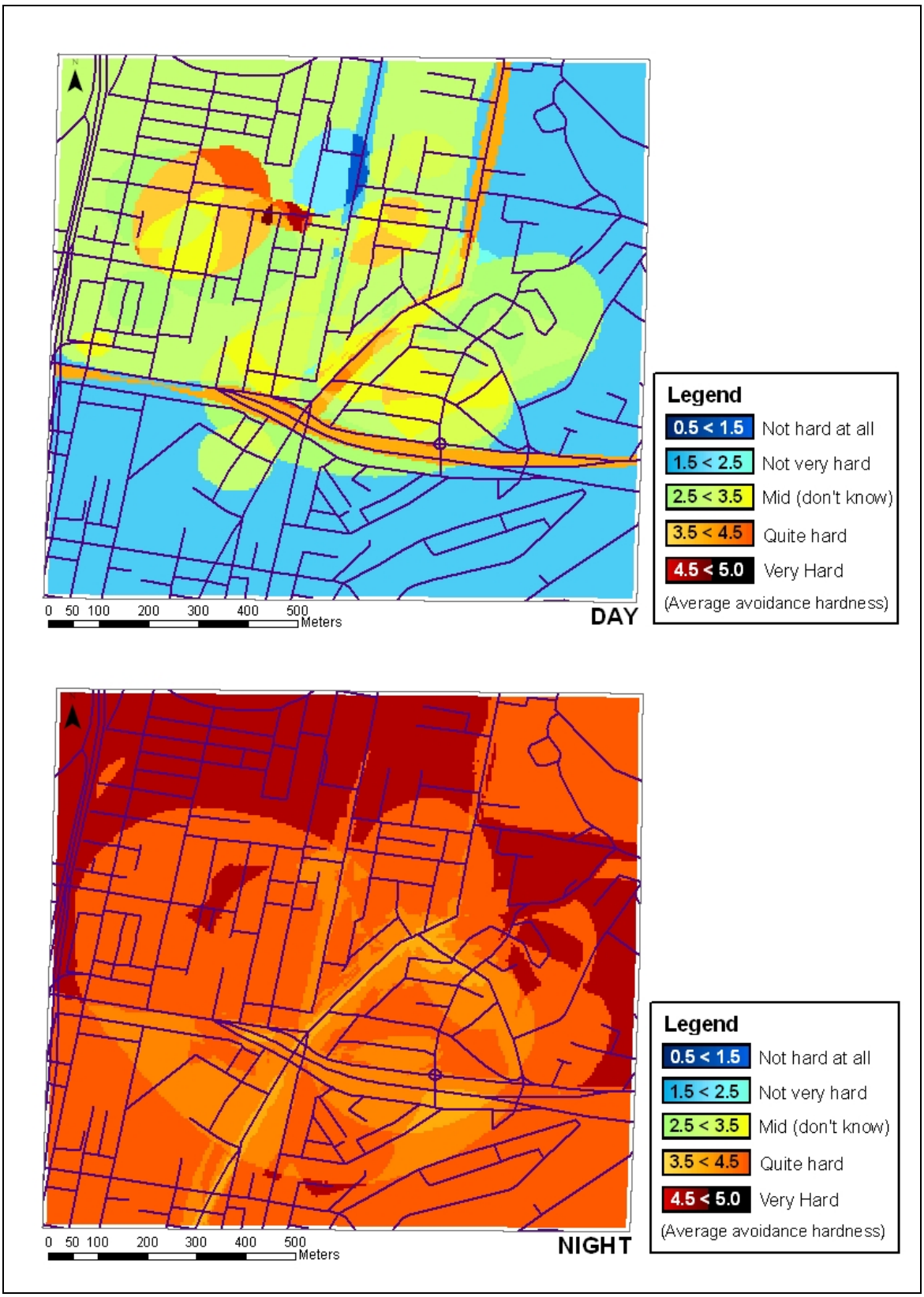


Figure 82. Average degree of avoidance hardness for areas where the survey respondents stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked – during the day and night.

8.3. Summary of the 2D fear maps results

This chapter presented the 2D avoidance density and avoidance hardness maps for drug users and sex workers (the 2D maps for the other 14 environmental cues are shown in Appendix B). These 2D maps make up the intermediate results from question 11, the mapping section of the survey. The final results from the mapping section of the survey comprise the 3D avoidance maps for selected environmental cues. These final 3D avoidance maps are displayed in the subsequent results chapter. However before these final results are presented, an examination of the 2D maps is offered in the next chapter.

9. Examining the 2D avoidance maps

As intermediary results, the 2D avoidance density and avoidance hardness maps presented in the previous results chapter are not discussed in the discussion and implications chapter.[196] Instead, these maps are broadly examined in this chapter, which provides an overview of the decision making process of selecting specific environmental cues for further 3D mapping. The 3D avoidance maps for the selected environmental cues are then shown in the subsequent results chapter.

9.1. The 2D avoidance density maps

The 2D avoidance density maps for the 16 environmental cues were created to help select specific environmental cues to be explored further using 3D visualisation. Each of the four types of avoidance density maps used a different method to classify the aggregate avoidance data so that any differences in the spatial patterns of avoidance would be highlighted. If the 2D maps revealed any environmental cues that triggered unique or contrasting avoidance patterns, they would be selected for 3D mapping. The selection process involved ranking the environmental cues by avoidance density, and highlighting any temporal and areal variation in the avoidance patterns. The results of these processes are discussed in the following sections.

9.1.1. Ranking the environmental cues by proportion of avoiding respondents

The first two classification methods produced avoidance density maps that were examined when ranking the environmental cues by proportion of respondents avoiding each area of the study site.[197] The levels of fear triggered by each of the environmental cues were compared and the day and night maps accordingly allocated an 'avoidance density rank'. Table 11 orders the environmental cues from highest to lowest as per

[196] An in depth discussion of the spatial patterns of avoidance and avoidance hardness weightings is reserved only for those environmental cues selected for 3D visualisation.
[197] These maps are displayed in sections 8.2.1 and 8.2.2 of the second results chapter (pages **Error! Bookmark not defined.** to **Error! Bookmark not defined.**) and sections 15.1 and 15.2 of Appendix B.

their ‘avoidance density rank’. An ‘avoidance percentage rank’ was also assigned to the environmental cues and used to order them in Table 11. The ‘avoidance percentage rank’ is based on the percentage of respondents who stated each environmental cue triggered their fear of being robbed, beaten or attacked.

Table 11 is divided into three sections grouping the top, middle and lowest ranked environmental cues. These groups were identified when examining the avoidance maps. However, the groups also roughly parallel natural breaks that can be observed when looking at the avoidance percentages for each environmental cue (listed in section 7.2.3 of the first results chapter). Despite arranging the environmental cues in a slightly different sequence, the ‘avoidance density order’ and ‘avoidance percentage order’ categorise each environmental cue into the same group. Drug users, gangs and intoxicated persons made up the top group, with the highest proportion of respondents avoiding each area. Laneways, areas to hide, loitering people, rubbish/syringes, blocked escape, pedestrian absence, and poor street lighting made up the middle group. While, Rundown/abandoned buildings, homeless people, offensive/degraded shops, vandalism, spruikers and sex workers made up the lowest group.

To illustrate differences in the proportion of respondents who avoided the study site because of the different environmental cues, at least one of the highest and lowest ranked environmental cues were selected for 3D visualisation. Two of the top three ranked environmental cues, drug users and gangs, were chosen for 3D mapping. Percent-wise, drug users ranked above gangs by 7% in the day and 8% in the night. While this is not a statistically significant difference, it is interesting because the assessment of the fear maps ranked gangs well above drug users in terms of the proportion of respondents avoiding each area. The maps also revealed slight areal differences in the patterns of avoidance for these two environmental cues. They were therefore chosen for further exploration and comparison with 3D mapping. In contrast to these highly ranked environmental cues, sex workers were ranked lowest according to the ‘avoidance density order’ and ‘avoidance percentage order’ for the day and night. They were therefore also selected for further mapping. Being the highest and lowest ranked environmental cues, drug users and sex workers were additionally chosen for 3D mapping to show patterns of avoidance adopted by the male and female respondents, and visitors and residents.

Table 11. Environmental cues by 'avoidance density rank' and 'avoidance percentage rank' (1 is highest, 16 is lowest).

Day			**Night**		
Rank	***Avoidance Density Order***	***Avoidance Percentage Order***	***Rank***	***Avoidance Density Order***	***Avoidance Percentage Order***
1	Gangs	Drug users (64%)	1	Gangs	Drug users (64%)
2	Intoxicated persons	Gangs (57%)	2	Drug users	Gangs (56%)
3	Drug users	Intoxicated persons (54%)	3	Intoxicated persons	Intoxicated persons (55%)
4	Laneways	Laneways (45%)	4	Rubbish/ syringes	Poor street lighting (52%)
5	Areas to hide	Rubbish/ syringes (44%)	5	Poor street lighting	Laneways (50%)
6	Loitering people	Loitering people (43%)	6	Laneways	Rubbish/ syringes (48%)
7	Rubbish/ syringes	Areas to hide (39%)	7	Areas to hide	Loitering people (46%)
8	Blocked escape	Poor street lighting (36%)	8	Loitering people	Areas to hide (43%)
9	Pedestrian absence	Blocked escape (35%)	9	Blocked escape	Pedestrian absence (37%)
10	Poor street lighting	Pedestrian absence (33%)	10	Pedestrian absence	Blocked escape (36%)
11	Offensive/ degraded shops	Homeless people (33%)	11	Rundown/ abandoned buildings	Rundown/ abandoned buildings (32%)
12	Homeless people	Rundown/ abandoned buildings (25%)	12	Vandalism	Homeless people (31%)
13	Vandalism	Vandalism (25%)	13	Offensive/ degraded shops	Vandalism (29%)
14	Rundown/ abandoned buildings	Spruikers (22%)	14	Homeless people	Offensive/ degraded shops (25%)
15	Spruikers	Offensive/ degraded shops (21%)	15	Spruikers	Spruikers (25%)
16	Sex workers	Sex workers (18%)	16	Sex workers	Sex workers (20%)

9.1.2. Highlighting temporal variation in avoidance patterns

The third type of classification method was used to produce avoidance density maps that were examined to investigate any temporal variation between avoidance during the day and night.[198] An assessment of these maps found a marked increase in avoidance between the day and night for all of the 16 environmental cues. This was most pronounced for drug users, intoxicated persons, gangs, rubbish/syringes and poor street lighting. The temporal variation found in the avoidance maps is quite consistent with that found by an examination of the percent-based changes in the proportion of respondents who stated each environmental cue triggered their fear of crime. Percent-wise, the most pronounced temporal variation between the day and night fear maps was found with poor street lighting. No environmental cues were selected for 3D mapping because of any noteworthy temporal variation between the avoidance maps for the day and night.

9.1.3. Highlighting areal variation in avoidance patterns

The last type of classification method was used to produce avoidance density maps that were examined to investigate any areal differences in the patterns of avoidance triggered by each environmental cue.[199] Overall, the maps show that each of the environmental cues triggered the respondents to adopt very similar patterns of avoidance. Avoidance is greatest in the northern half of the study site, above William Street, for all environmental cues. North of William Street, avoidance is commonly highest in three distinct areas, referred to as Blocks A, B and C. The first of the three fear hotspots, Peak A, centres over Woolloomooloo. However, the coverage and definition of Peak A varies greatly for each environmental cue. Victoria Street, Orwell Street and Darlinghurst Road are frequently the boundaries for the second area (Peak B). Streets within this area include Earl Place, Earl Street, Llankelly Lane, Mall Place, and Springfield Avenue. Peak B often extends to include Orwell Lane, Hughes Lane, Hughes Place, and Hughes Street. Darlinghurst Road, Bayswater Road, Roslyn Street and Ward Avenue border Peak C, the third area where avoidance is commonly high.

[198] These maps are displayed in section 8.2.3 of the second results chapter (pages **Error! Bookmark not defined.** to **Error! Bookmark not defined.**) and section 15.3 of Appendix B.
[199] These maps are displayed in section 8.2.4 of the second results chapter (pages **Error! Bookmark not defined.** to **Error! Bookmark not defined.**) and section 15.4 of Appendix B.

Peak C encompasses Kellett Way, Kellett Street, and Mansion Lane. Blocks A, B and C are displayed in Figure 83. In comparison to the north, avoidance is generally lower in the study site south of William Street for most of the environmental cues.

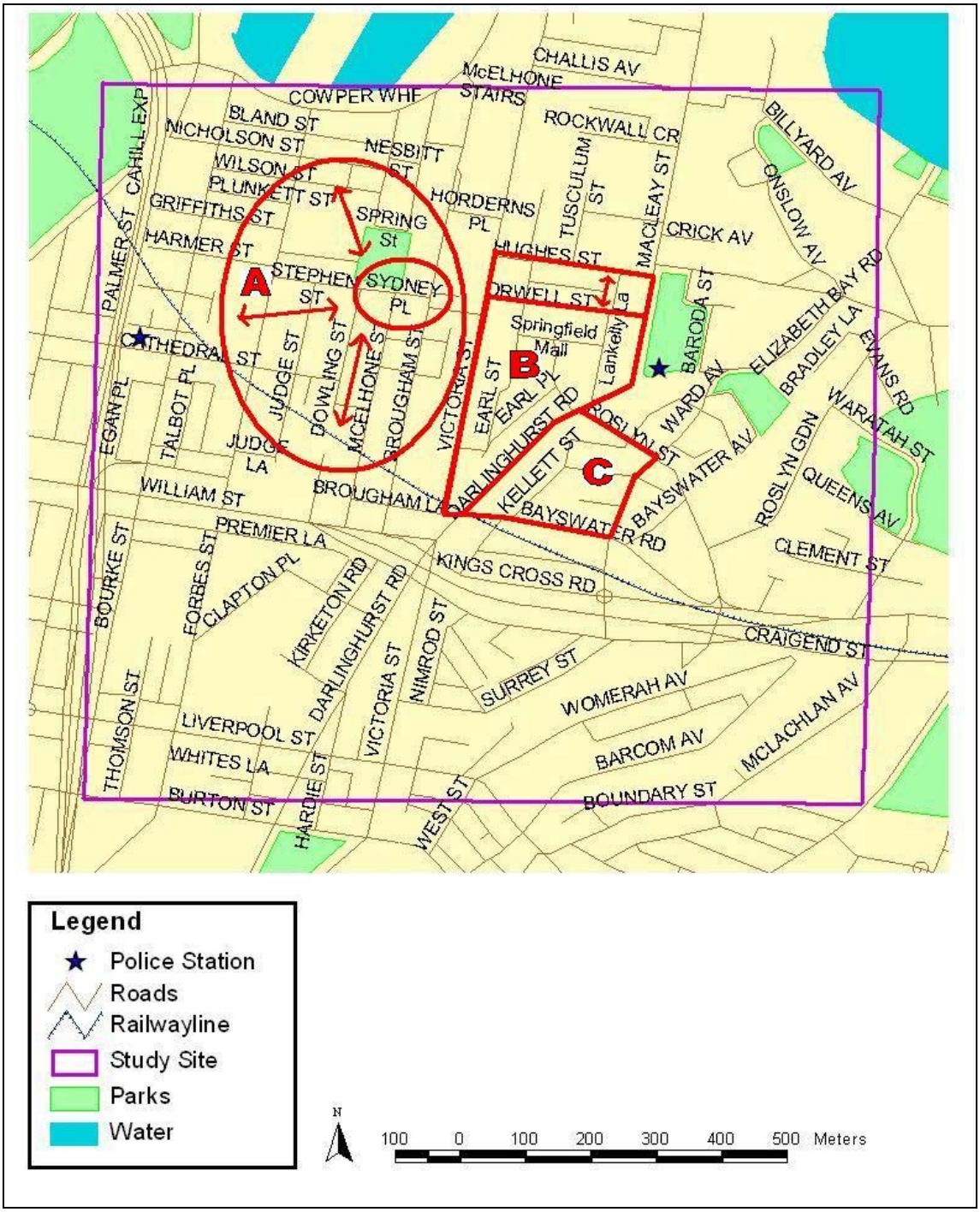


Figure 83. The Kings Cross study site depicting Blocks A, B and C, which make up the three common fear of crime hotspots.

While the patterns of avoidance were reasonably consistent across all of the environmental cues, the areas to hide avoidance maps were more spatially general than the others. The areas to hide map was ranked in the middle grouping in Table 11. Areas to hide were therefore selected for 3D visualisation to provide a comparison with the maps of the other environmental cues chosen for further mapping.

9.1.4. The 2D avoidance hardness maps

The 2D avoidance hardness maps for the 16 environmental cues were also created to help select specific environmental cues to be explored further using 3D visualisation.[200] The avoidance hardness maps for each of the environmental cues during the night were quite consistent. The average avoidance hardness weighting for the majority of the study site, regardless of the environmental cue in question, was 'quite hard'. Many of the avoidance hardness maps for the night also had smaller areas where the avoidance hardness weighting was in the middle (mid/don't know) or top ('very hard') of the Avoidance Hardness Index. The 'mid' areas generally ran along, or centred over, Darlinghurst Road. The 'very hard' areas were generally situated on the outer regions of the study site.

For the day, there is a little less consistency between the avoidance hardness maps for each environmental cue. Table 12 in the following page, provides an overview of the avoidance hardness weightings on the avoidance hardness map for each environmental cue during the day. Most of the environmental cues have avoidance hardness weightings ranging from 'mid' to 'quite hard'. A few of the avoidance hardness maps for the day also have areas where the avoidance hardness weighting was in the 'not very hard' category. No environmental cues were selected for 3D mapping because of any noteworthy differences in the average avoidance hardness weightings.

[200] These maps are displayed in section 8.2.5 of the second results chapter (pages **Error! Bookmark not defined.** to **Error! Bookmark not defined.**) and section 15.5 of Appendix B.

Table 12. A generalised overview of the avoidance hardness weightings on the avoidance hardness maps for each environmental cue during the day. The 'North' and 'South' refers to the study site north and south of William Street.

	1 *Not hard at all*	*2* *Not very hard*	*3* *Mid (don't know)*	*4* *Quite hard*	*5* *Very hard*
Drug users*		Half of the South	Half of the South	Majority of the North	Small spots in the North
Spruikers		Majority of the South	Majority of the North	Some of the North	Small spots in the North
Homeless people			Majority of the North and South	Some of the North	
Intoxicated persons			Majority of the South	Majority of the North	
Sex workers*	Small spots in the North	Majority of the South; Half of the North	Half of the North	Small spots in the North	Small spots in the North
Gangs*			All of the South	All of the North	
Loitering people			All of the South	All of the North	
Pedestrian absence			All of the South	Majority of the North	
Poor street lighting		Majority of the South	Some of the North	Large areas in the North	
Vandalism			Majority of the South; Some of the North	Majority of the North	
Rubbish/ syringes		Small spots in the South	Majority of the North/South	Some of the North	
Rundown/ abandoned buildings		Majority of the South; Small spots in North	Majority of the North	Some of the North	
Offensive/ degraded shops		Majority of the South	Some of the North	Majority of the North	
Areas to hide*			Majority of the South; Some North	Majority of the North	
Blocked escape			Half of the South; Some of the North	Majority of the North	
Laneways				Majority of South/North	

*Environmental cues already chosen for further exploration using 3D visualisation.

9.2. Summary of the chapter

This chapter explains why and how four environmental cues were selected for 3D mapping. The maps confirmed each environmental cue triggered different levels of avoidance. Two cues triggering high levels of avoidance, drug users and gangs, and one cue triggering the lowest level of avoidance, sex workers, were selected for 3D mapping. As the highest and lowest ranked cues, drug users and sex workers were additionally chosen for 3D mapping by respondent's sex and residential status. The maps demonstrated that many of the environmental cues triggered common patterns of avoidance. Generally, avoidance was highest in the northern half of the study site in three main street blocks. These high fear areas were not so apparent on the a*reas to hide* maps, which has more spatially general avoidance patterns than most of the other environmental cues. *Areas to hide* was therefore also selected for 3D mapping. The maps demonstrated an increase in avoidance between the day and night for all of the environmental cues. No environmental cues were selected because of any unique temporal variation in avoidance. Likewise, no environmental cues were selected because of any unique differences in how hard the respondents tried to avoid each area. The 3D maps for the four selected environmental cues are presented the next results chapter.

10. Results: The 3D avoidance maps

This chapter presents the fear maps for the four selected environmental cues, drug users, gangs, areas to hide and sex workers. The sections showing fear of crime triggered by the perceived presence of drug users and sex workers are longer than those for gangs and areas to hide. Additional fear maps are presented for drug users and sex workers, showing patterns of avoidance adopted by the male and female respondents, and visitors and residents. Each of the 3D maps can be viewed from all angles in the movie files on the accompanying compact disc. Advice on how to interpret these maps is given before these results are displayed.

10.1. Interpreting the 3D avoidance maps

The 3D maps illustrate areas of fear according to the number of people avoiding them and the extent to which those people tried to avoid the areas. The elevation (z-factor) of the surface represents the number of people avoiding an area, with higher land being avoided by more people than lower land. Population percentile bands (the white horizontal lines) indicate what proportion of all respondents the number of people avoiding each area represents. Each band indicates a 5% increase or decrease in the number of avoiding respondents. The colour of the land shows how hard the respondents tried to avoid each area.

10.2. Fear of crime due to the perceived presence of drug users

This section shows and describes the avoidance maps illustrating areas the respondents avoided because the perceived presence of drug users triggered their fear of being robbed, beaten or attacked. Overall patterns of avoidance are depicted for the day and night respectively. The fear maps for the male and female respondents, and visitors and residents, follow the descriptions of these overall maps.

10.2.1. Avoidance during the day for all respondents

The radical change in elevation in the centre of the drug users map shows an enormous divide in collective avoidance either side of William Street (see Figure 84). Excluding the main roads, nine respondents avoid the lowest point north of William Street, whereas two respondents avoid the lowest point south of William Street.

For drug users during the day, Peak A is apparent, however not obvious. Avoidance increases gradually from the Cahill Expressway in the West and Cowper Wharf Roadway in the North, to the centre of Woolloomooloo. Avoidance is heightened in two places, one over Sydney Place and the other over the Forbes and Judge Street walkways, which are avoided by a maximum of 22 and 24 respondents respectively. In contrast, Peak B is a clearly defined fear hotspot, particularly along Earl Place, which is avoided by a maximum of 28 respondents. To the north, avoidance increases from Orwell Street. Peaks A and B are separated slightly by Victoria Street, which is avoided by 15 respondents near Earl Street and seven respondents near Horderns Place. Darlinghurst Road more visibly divides Peaks B and C, being avoided by between 10 and 18 respondents. Similarly, about seven fewer respondents avoid MacLeay Street than in the general surrounding areas.

Aggregate avoidance during the day was greatest over Peak C, which was avoided by a 33 respondents at its maximum. Peak C begins at William Street, Darlinghurst Road, Roslyn Gardens and Baroda Street. However, avoidance climbs more steadily over Bayswater Road and Roslyn Street to peak over Kellett Street. Nine to twelve respondents avoided most of the remainder of the study site because the presence of drug users triggered their fear of crime. Avoidance is fairly constant south of William Street, increasing slightly from two respondents in the flanks of the study site up to six respondents where William Street and Darlinghurst Road meet. The Avoidance Hardness Index ranged from ‘Mid’ to ‘Quite Hard’ in the north of the study site, and ‘Not Very Hard’ to ‘Mid’ in the south of the study site.

10.2.2. Avoidance during the night for all respondents

Avoidance due to the presence of drug users triggering respondent fear of crime significantly increased from the day to the night (see Figure 84). During the night, William Street presents an even greater divide in collective avoidance than in the day. Excluding the main roads, 28 respondents avoid the lowest point north of William Street, whereas 19 respondents avoid the lowest point south of William Street.

Peak A is more defined for drug users during the night than the day. Avoidance steadily increases from the Cahill Expressway in the West and Cowper Wharf Roadway in the North, to the centre of Woolloomooloo. Avoidance peaks at 65 respondents in two places, one between Windeyer Street and Rae Place and the other above Kings Cross Railway Station. With steeper boundaries, Peak B is more distinct than Peak A. Peak B is highest along Earl Place, which is avoided by a maximum of 72 respondents. To the north, avoidance also increases from Orwell Street. Peaks A and B are separated slightly by Victoria Street, which is avoided by 60 respondents near Earl Street and 37 respondents near Horderns Place. Darlinghurst Road more visibly divides Peaks B and C, being avoided by between 41 and 51 respondents. About nine fewer respondents avoid MacLeay Street than the general surrounding areas.

Aggregate avoidance during the night was also greatest over Peak C, which was avoided by 76 respondents at its maximum. Peak C during the night is similar in shape as it is during the day. Again, avoidance climbs more steadily over Bayswater Road and Roslyn Street to peak dramatically over Kellett Street, which is avoided by approximately 10 more respondents than the surrounding area. Twenty-seven to 35 respondents avoided most of the remainder of the study site because the presence of drug users triggered their fear of crime. South of William Street, avoidance increases from 21 respondents in the flanks up to 46 respondents where William Street and Darlinghurst Road meet. Avoidance is slightly lower in Darlinghurst Road and Victoria Street than the surrounding area. The Avoidance Hardness Index ranged from ‘Quite Hard’ to ‘Very Hard’ over the entire study site.

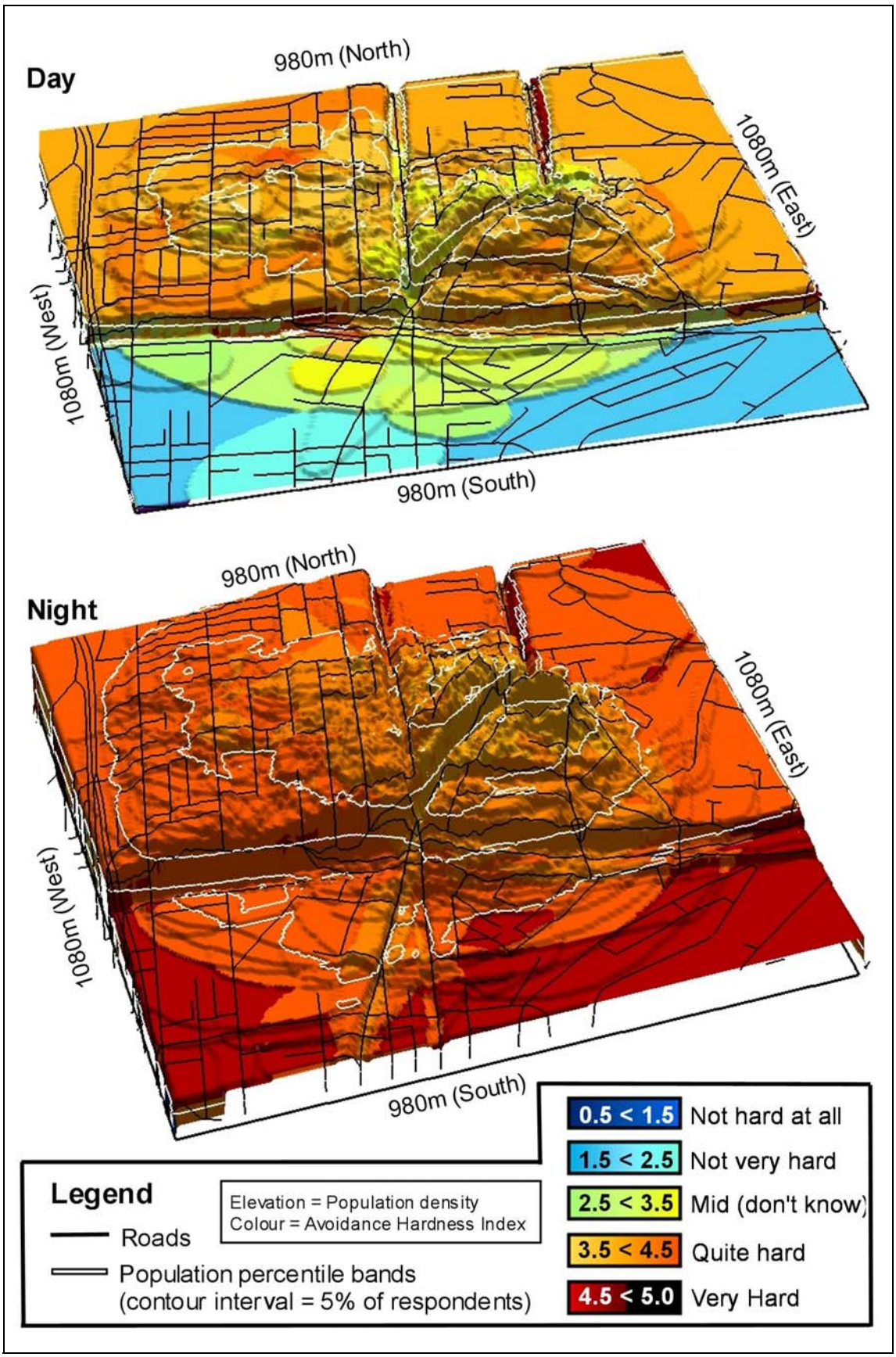


Figure 84. Areas where the respondents stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked – during the day and night.

10.2.3. Avoidance during the day and night for the male and female respondents

Figure 85 and Figure 86 indicate there are differences in the patterns of avoidance adopted by the male and female respondents because the presence of drug users triggered their fear of crime.

For the male respondents, aggregate avoidance during the day was greatest in Peak B, which was avoided by sixteen males over Earl Place. The Blocks centering over Sydney Place Woolloomooloo and Peak C were avoided by a maximum of eleven and twelve males respectively. Between seven and ten males avoided Darlinghurst Road, and between one and four males avoided Victoria and MacLeay Streets. There were no male respondents who avoided the flanks of the study site south of William Street. One to three males avoided most of the remainder of the study site. North of William Street, the Avoidance Hardness Index ranged from 'Quite Hard' in the west to 'Mid' in the east. Parts of the study site south of William Street, Avoidance Hardness were also in the 'Not Very Hard' and 'Very Hard' Avoidance Hardness categories.

Aggregate avoidance during the day for the females was greatest in Peak C, which was avoided by twenty-one females over Kellett Street. The peaks centering over Sydney Place Woolloomooloo and Peak C were avoided by a maximum of twelve and seventeen females respectively. Between seven and ten males avoided Darlinghurst Road, between five and nine females avoided Victoria Street, and between one and four females avoided MacLeay Street. The remainder of the study site north of William Street was avoided by between seven and nine females. Avoidance immediately dropped to two to three female respondents south of William Street. North of William Street, the Avoidance Hardness Index was predominately in the 'Quite Hard' category, with a small area along Victoria Street in the 'Mid' category. South of William Street, the Avoidance Hardness Index was in the 'Not Very hard' to Mid' categories.

More male respondents adopted avoidance behaviour due to the presence of drug users during the night than the day. Aggregate avoidance during the night was greatest in Peak C, which is defined by two peaks. The first of these illustrates a quick increase in avoidance from approximately 20 to 25 males over Bayswater Road. The second

illustrates another sharp increase in avoidance to 38 males directly over Kellett Way. A peak of 36 avoiding males also defines Peak B, predominately along Earl Place. Aggregate avoidance reached a maximum of 28 males over Woolloomooloo, with the gradient of this peak being quite gradual. Between 17 and 28 males avoided Darlinghurst Road, between 12 and 25 males avoided Victoria Street, and between 7 and 12 males avoided MacLeay Street. The remainder of the study site north of William Street was avoided by between seven and 13 males. Avoidance immediately dropped to five male respondents south of William Street. South of William Street, avoidance density ranged from five males in the flanks of the study site to 23 in the middle where Darlinghurst Road and Victoria Street meet. The Avoidance Hardness Index over the entire study site ranged from 'Quite Hard' to 'Very Hard', with most of the study site south of William Street being in the 'Very Hard' category.

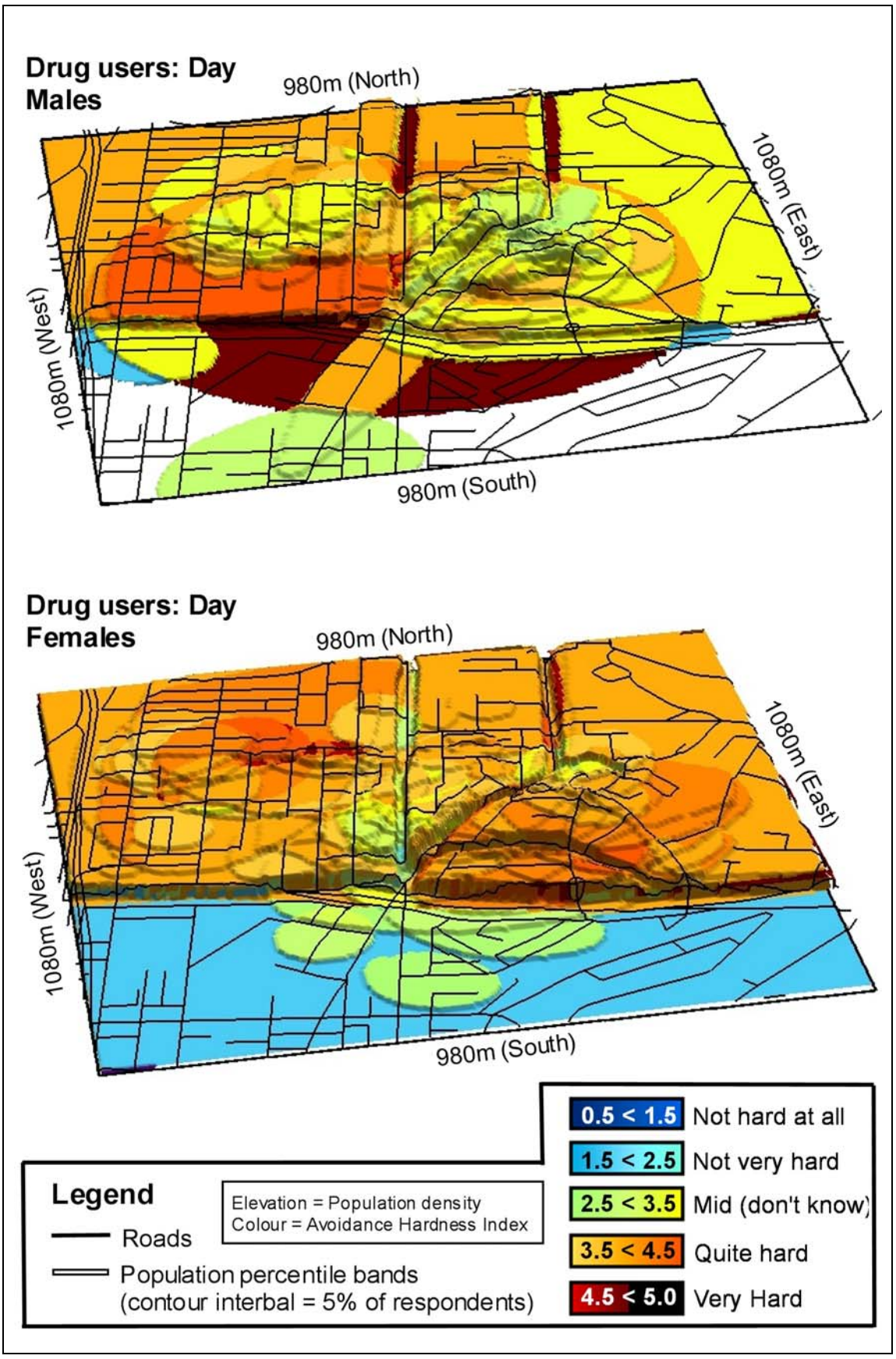


Figure 85. Areas the MALES and FEMALES stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked during the DAY.

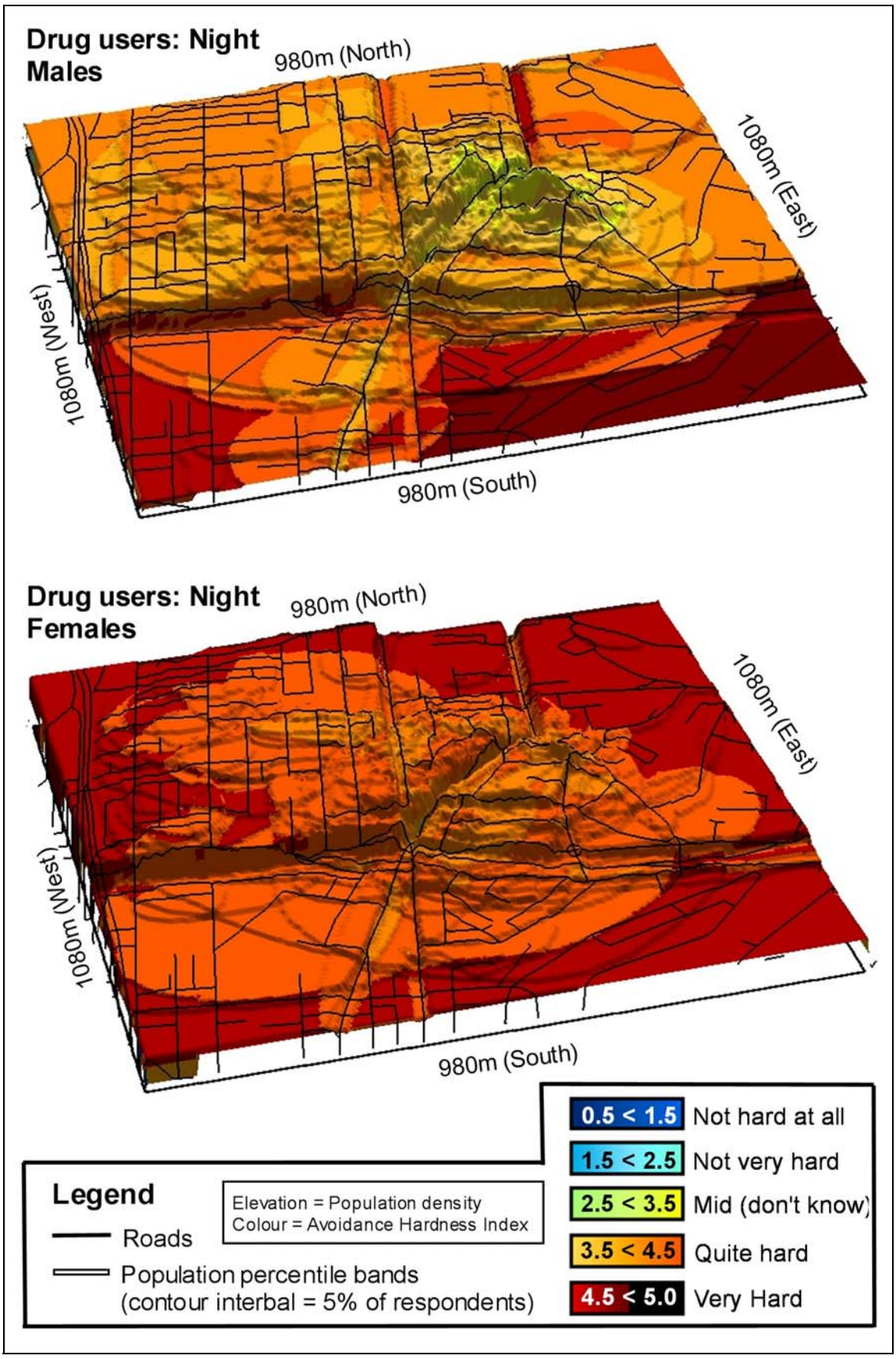


Figure 86. Areas the MALES and FEMALES stated the presence of DRUG USERS triggered their fear of being robbed, beaten or attacked during the NIGHT.

10.2.4. Avoidance during the day and night for the residents and visitors

Figure 87 and Figure 88 indicate that there are differences in the patterns of avoidance adopted by the residents and visitors because the presence of drug users triggered their fear of crime.

For the residents, aggregate avoidance during the day was greatest in Peak C, particularly over Kellett Street, which was avoided by 14 residents. An avoidance peak was also noticeable specifically over Earl Place in Peak B, which was avoided by 10 residents. Peak A is not evident, however 9 residents did avoid a small area over Sydney Place. Between 5 and 6 residents avoided Darlinghurst Road, between 1 and 5 residents avoided Victoria Street, and between 0 and 5 residents avoided MacLeay Street. There were no residents who avoided the flanks of the study site south of William Street. Between 1 and 2 residents avoided most of the remainder of the study site. The Avoidance Hardness Index ranged from 'Quite Hard' on the outskirts of the three common hotspots, to 'Mid' within them.

Aggregate avoidance during the day for the visitors was spatially general. It was greatest in Peak B, which was avoided by 21 visitors between Earl Place and Darlinghurst Road. However, neither Peaks A or B are visible in comparison to levels of avoidance in the surrounding area. Woolloomooloo was avoided by up to 16 visitors between Best and Stephen Streets. Peak C was avoided by a maximum 19 visitors at Roslyn Street and Kellett Way. Between 7 and 11 visitors avoided Darlinghurst Road, between 5 and 13 visitors avoided Victoria Street, and between 2 and 8 visitors avoided MacLeay Street. The remainder of the study site north of William Street was avoided by between 7 and 9 visitors. Avoidance immediately dropped to 2 and 5 visitors respondents south of William Street. North of William Street, the Avoidance Hardness Index was predominately in the 'Quite Hard' category. South of William Street, the Avoidance Hardness Index was in the 'Not Very hard' to Mid' categories.

More residents adopted avoidance behaviour due to the presence of drug users during the night than the day. Aggregate avoidance during the night was greatest in Peak C, specifically over Kellett Way and Roslyn Street, which were avoided by 39

residents. Peak B was avoided by up to 37 residents over Springfield Avenue. Woolloomooloo was avoided by a maximum of 31 residents at Dowling Street. Between 20 and 27 residents avoided Darlinghurst Road, between 20 and 25 residents avoided Victoria Street, and between 8 and 18 residents avoided MacLeay Street. The remainder of the study site was avoided by between 11 and 15 residents. The Avoidance Hardness Index over the entire study site ranged from 'Quite Hard' to 'Very Hard', with most of the study site south of William Street being in the 'Very Hard' category.

More visitors adopted avoidance behaviour due to the presence of drug users during the night than the day. Aggregate avoidance during the night for the visitors was greatest in Peak B, which was avoided by 40 visitors over Earl Place. However, as during the day, neither Peaks A or B are visible in comparison to levels of avoidance in the surrounding area. Woolloomooloo was avoided by a maximum of 35 visitors around Rae Place and to the west of Victoria Street. Up to 38 visitors avoided Peak C over Kellett Way. Between 20 and 24 visitors avoided Darlinghurst Road, between 19 and 36 visitors avoided Victoria Street, and between 12 and 18 visitors avoided MacLeay Street. The remainder of the study site north of William Street was avoided by between 15 and 21 visitors. South of William Street as avoided by a maximum of 18 visitors. The Avoidance Hardness Index over the entire study site ranged from 'Quite Hard' to 'Very Hard', with most of the study site south of William Street being in the 'Very Hard' category.

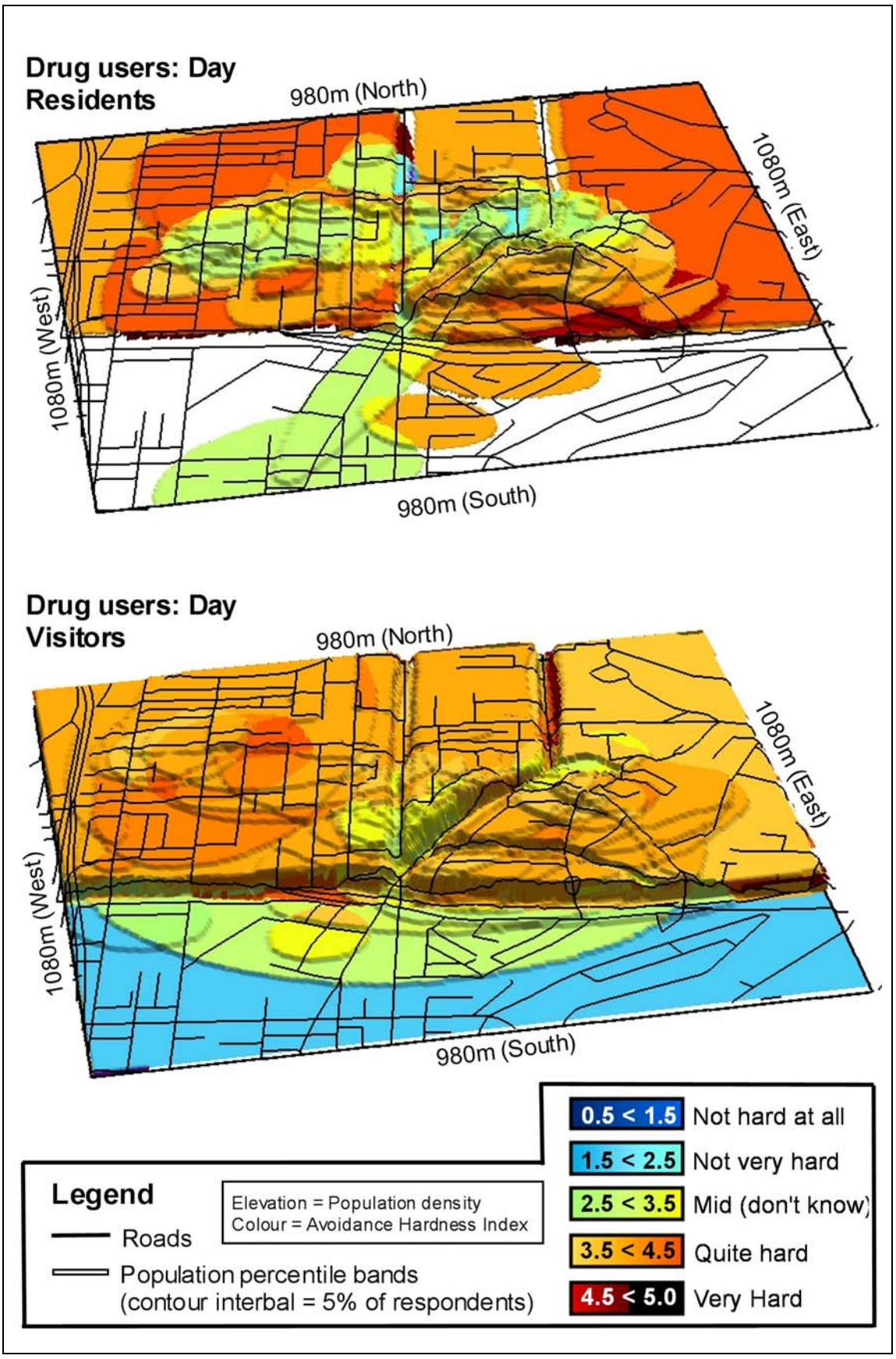


Figure 87. Areas the RESIDENTS and VISITORS stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked during the DAY.

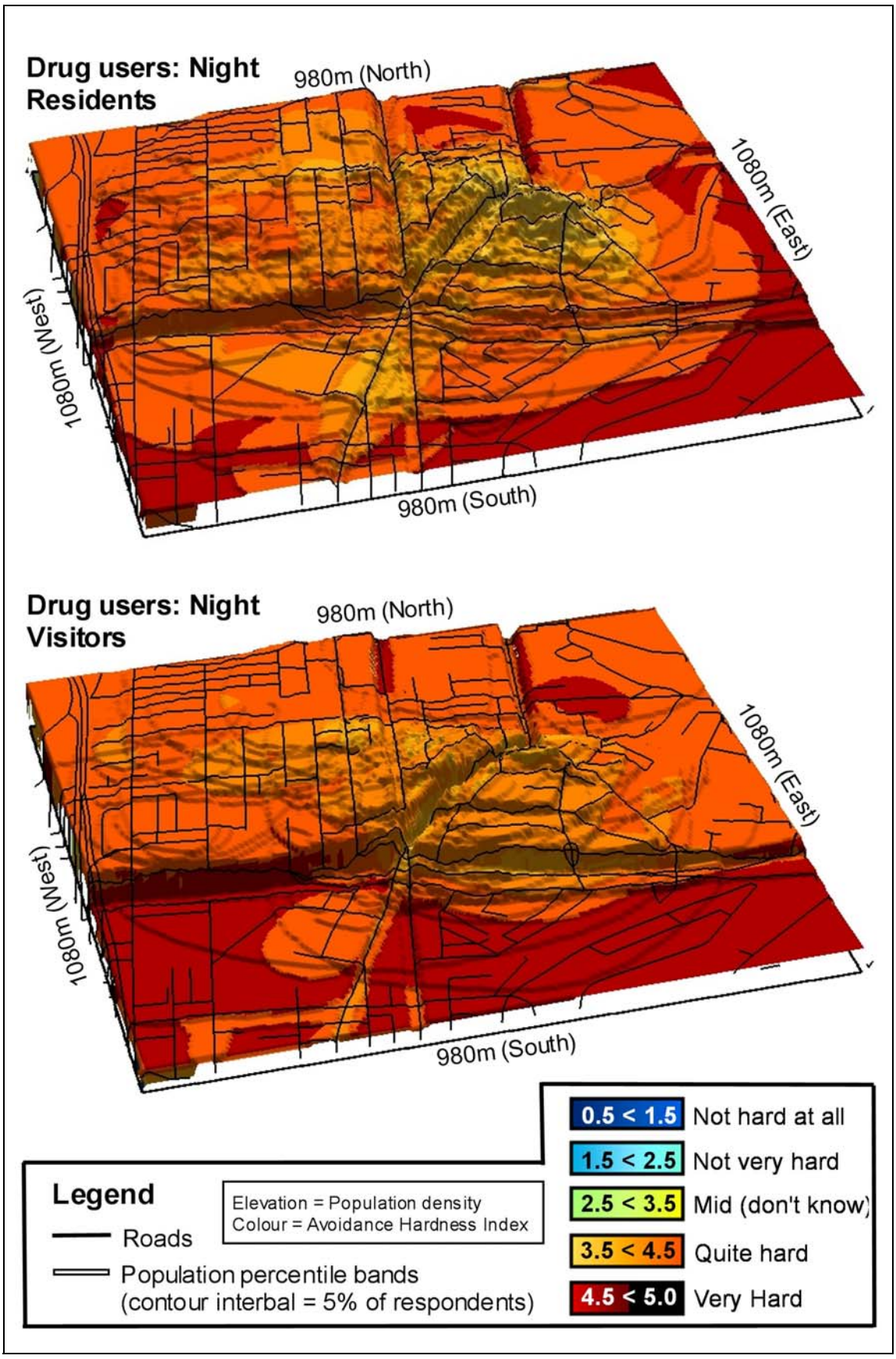


Figure 88. Areas the RESIDENTS and VISITORS stated the presence of *DRUG USERS* triggered their fear of being robbed, beaten or attacked during the NIGHT.

10.3. Fear of crime due to the perceived presence of gangs

This section shows and describes the avoidance maps illustrating areas the respondents avoided because the perceived presence of gangs triggered their fear of being robbed, beaten or attacked. Patterns of avoidance are depicted for the day and night respectively (see Figure 89).

10.3.1. Avoidance during the day for all respondents

The radical change in elevation in the centre of the *gangs* map also shows an enormous divide in collective avoidance either side of William Street. Excluding the main roads, thirteen respondents avoid the lowest point north of William Street, whereas four respondents avoid the lowest point south of William Street.

For gangs during the day, Peak A is evident, however not clearly defined. Avoidance increases gradually from the Bourke Street in the West and Bland Street in the North, to the centre of Woolloomooloo. Avoidance reaches a maximum of 29 respondents in the areas immediately surrounding Sydney Place and Stephen Street. In contrast, Peak B is a much more clearly defined fear hotspot than Peak A. Aggregate avoidance during the day was greatest over Peaks B and C. For Peak B, this is particularly the case along Earl Place and the western side of Darlinghurst Road, which are avoided by a maximum of 33 and 34 respondents respectively. To the north, avoidance increases from Orwell Street. Peaks A and B are separated slightly by Victoria Street, which is avoided by 17 respondents near Earl Street and 14 respondents near Horderns Place. Darlinghurst Road also divides Peaks B and C, being avoided by between 19 and 22 respondents. About six fewer respondents avoid MacLeay Street than in the general surrounding areas.

Thirty-four respondents avoided Peak C at its maximum, like Peak B. Peak C begins at William Street, Darlinghurst Road, Roslyn Gardens and Baroda Street. However, avoidance climbs more steadily immediately over Bayswater Road and within the area bounded by Roslyn Street and Ward Avenue to peak over Kellett Way and

Kellett Street. Thirteen to seventeen respondents avoided most of the remainder of the study site north of William Street because the presence of gangs triggered their fear of crime. Avoidance is fairly constant south of William Street, increasing slightly from four respondents in the flanks of the study site up to nine respondents where William Street and Darlinghurst Road meet. The Avoidance Hardness Index was in the 'Quite Hard' category in the north of the study site, and 'Mid' category in the south of the study site.

10.3.2. Avoidance during the night for all respondents

Avoidance due to the presence of gangs triggering respondent fear of crime significantly increased from the day to the night. During the night, William Street presents an even greater divide in collective avoidance than in the day. Excluding the main roads, 30 respondents avoid the lowest point north of William Street, whereas 15 respondents avoid the lowest point south of William Street.

Peak A is more defined for gangs during the night than the day. Avoidance steadily increases from the Cahill Expressway in the West and Cowper Wharf Roadway in the North, to the centre of Woolloomooloo. Avoidance is quite regular over Woolloomooloo, however reaches a maximum of 65 avoiding respondents along Windeyer Street and the Western side of Victoria Road where it intersects Earl Street. In contrast, Peak B is a much more clearly defined fear hotspot than Peak A. As in the day, Peak B is highest along Earl Place, which is avoided by a maximum of 72 respondents. To the north, avoidance also increases from Orwell Street. Peaks A and B are separated slightly by Victoria Street, which is avoided by 59 respondents near Earl Street and 37 respondents near Horderns Place. Darlinghurst Road more visibly divides Peaks B and C, being avoided by between 47 and 52 respondents. About 9 fewer respondents avoid MacLeay Street than in the general surrounding areas.

Aggregate avoidance during the night was also greatest over Peak C, which was avoided by 75 respondents at its maximum. Peak C during the night is similar in shape as it is during the day. Again, avoidance climbs more steadily over Bayswater Road and Roslyn Street to peak dramatically over Kellett Street, which is avoided by approximately 10 more respondents than the surrounding area. Thirty-two to 35

respondents avoided most of the remainder of the study site north of William Street because the presence of gangs triggered their fear of crime. South of William Street, avoidance increases from 19 respondents in the flanks up to 35 respondents where William Street and Darlinghurst Road meet. Avoidance is slightly lower in Darlinghurst Road and Victoria Street than the surrounding area. The Avoidance Hardness Index was in the high range of the 'Quite Hard' category over the entire study site.

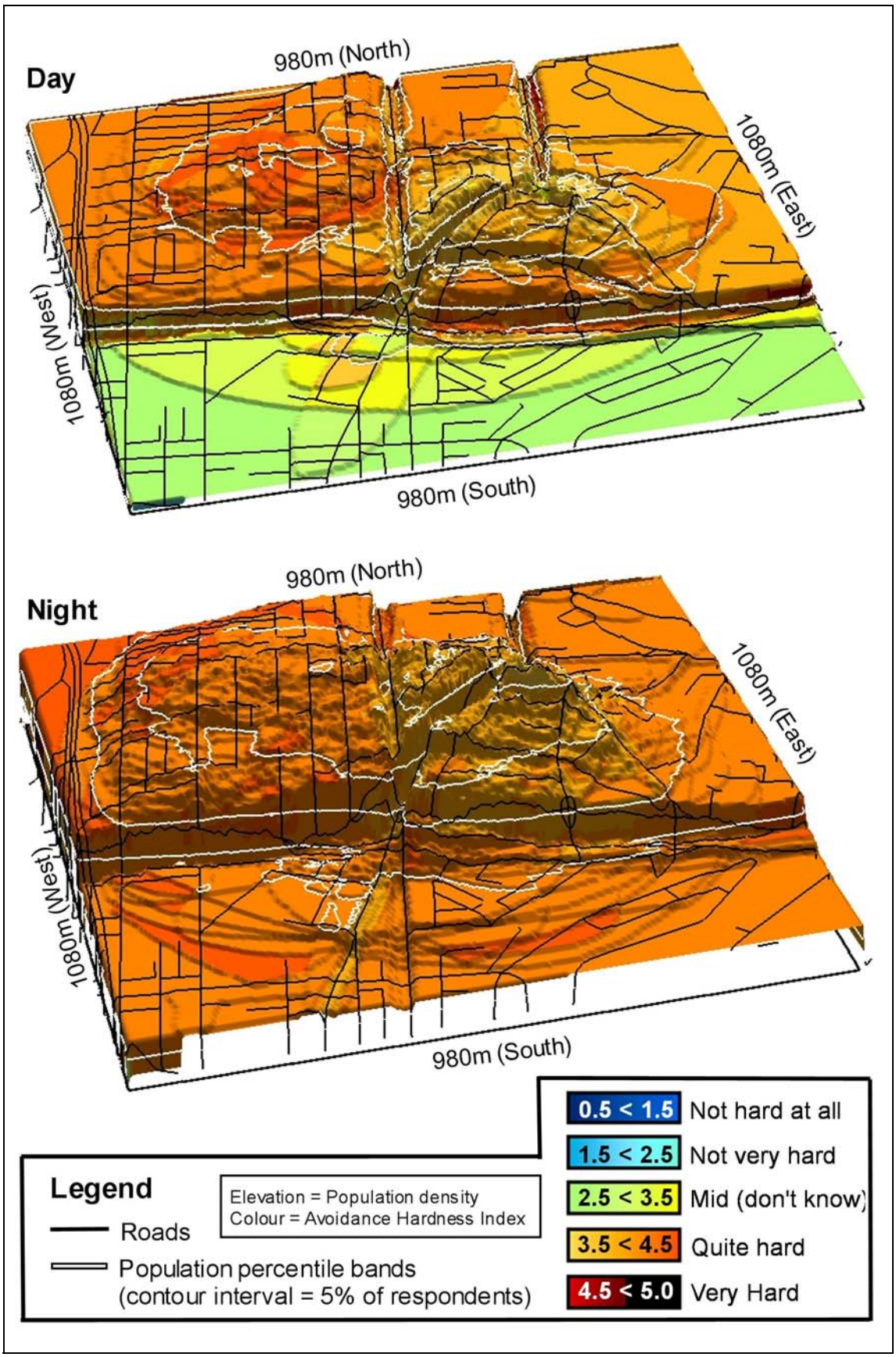


Figure 89. Areas where the respondents stated the presence of *GANGS* triggered their fear of being robbed, beaten or attacked – during the day and night.

10.4. Fear of crime due to the perception of areas to hide

This section shows and describes the fear maps illustrating areas the respondents avoided because the perceived presence of areas to hide triggered their fear of being robbed, beaten or attacked. Patterns of avoidance are depicted for the day and night respectively (see Figure 90).

10.4.1. Avoidance during the day for all respondents

On the areas to hide day map William Street also marks a change in collective avoidance between the southern and northern halves of the study site. Ten respondents avoid the lowest point north of William Street, whereas five respondents avoid the lowest point south of William Street.

Avoidance is quite regular over Woolloomooloo and Peak A is not evident as a distinct peak. Avoidance in the Woolloomooloo region increases to a maximum height of 23 respondents over Sydney Place. Peaks A and B are faintly separated by Victoria Street, which is avoided by 16 respondents near Earl Street and 11 respondents near Horderns Place. With a steeper gradient from Orwell Street and Darlinghurst Road, Peak B is slightly more defined than Peak A. Aggregate avoidance during the day was greatest over Peaks B and C. Avoidance was heightened in Peak B over Earl Place and over Kellett Street in Peak C, both avoided by 24 respondents. The gentle gradient of Peak C begins at William Street, Darlinghurst Road, Roslyn Gardens and Baroda Street. While avoidance increases sharply from Bayswater Road to the centre of Peak C, avoidance is slightly lower in Bayswater Road than in the area adjoining with William Street. Darlinghurst Road clearly divides Peaks B and C, being avoided by between 7 and 11 respondents. About seven fewer respondents avoid MacLeay Street than in the general surrounding areas. The Avoidance Hardness Index was mainly in the ‘Quite Hard’ category in the north of the study site, and the upper range of the ‘Mid’ category in the south of the study site.

10.4.2. Avoidance during the night for all respondents

Avoidance due to areas to hide triggering respondent fear of crime significantly increased from the day to the night. During the night, William Stre*et al*so presents a divide in collective avoidance. This divide is more pronounced in the west of the study site than the east.

Peak A is slightly more defined for the *areas to hide* map during the night than the day. Avoidance steadily increases from the Cahill Expressway in the West and Cowper Wharf Roadway in the North, to the centre of Woolloomooloo. As in the day, avoidance is quite regular over Woolloomooloo, ranging from 45 to 49 avoiding respondents for most of Peak A. Peaks A and B are again faintly separated by Victoria Street, which is avoided by 44 respondents near Earl Street and 29 respondents near Horderns Place. With a steeper gradient from Orwell Street and Darlinghurst Road, Peak B is slightly more defined than Peak A. Avoidance reaches a maximum of 49 avoiding respondents at the Earl Street and Earl Place intersection. Darlinghurst Road clearly divides Peaks B and C, being avoided by between 29 and 35 respondents. About six fewer respondents avoid MacLeay Street than in the general surrounding areas.

Aggregate avoidance during the night was greatest over Peak C, which was avoided by 56 respondents at its maximum. The base of Peak C is smaller for the night than the day. Avoidance climbs more steadily over Bayswater Road and Ward Avenue to peak over Kellett Way, which is avoided by approximately five more respondents than the surrounding area. Twenty-two to 30 respondents avoided most of the remainder of the study site north of William Street because areas to hide triggered their fear of crime. South of William Street, avoidance increases slightly from 19 respondents in the flanks up to 34 respondents where William Street and Darlinghurst Road meet. Avoidance is slightly lower in Darlinghurst Road and Victoria Street than the surrounding area. The Avoidance Hardness Index was in the high range of the ‘Quite Hard’ category over the entire study site.

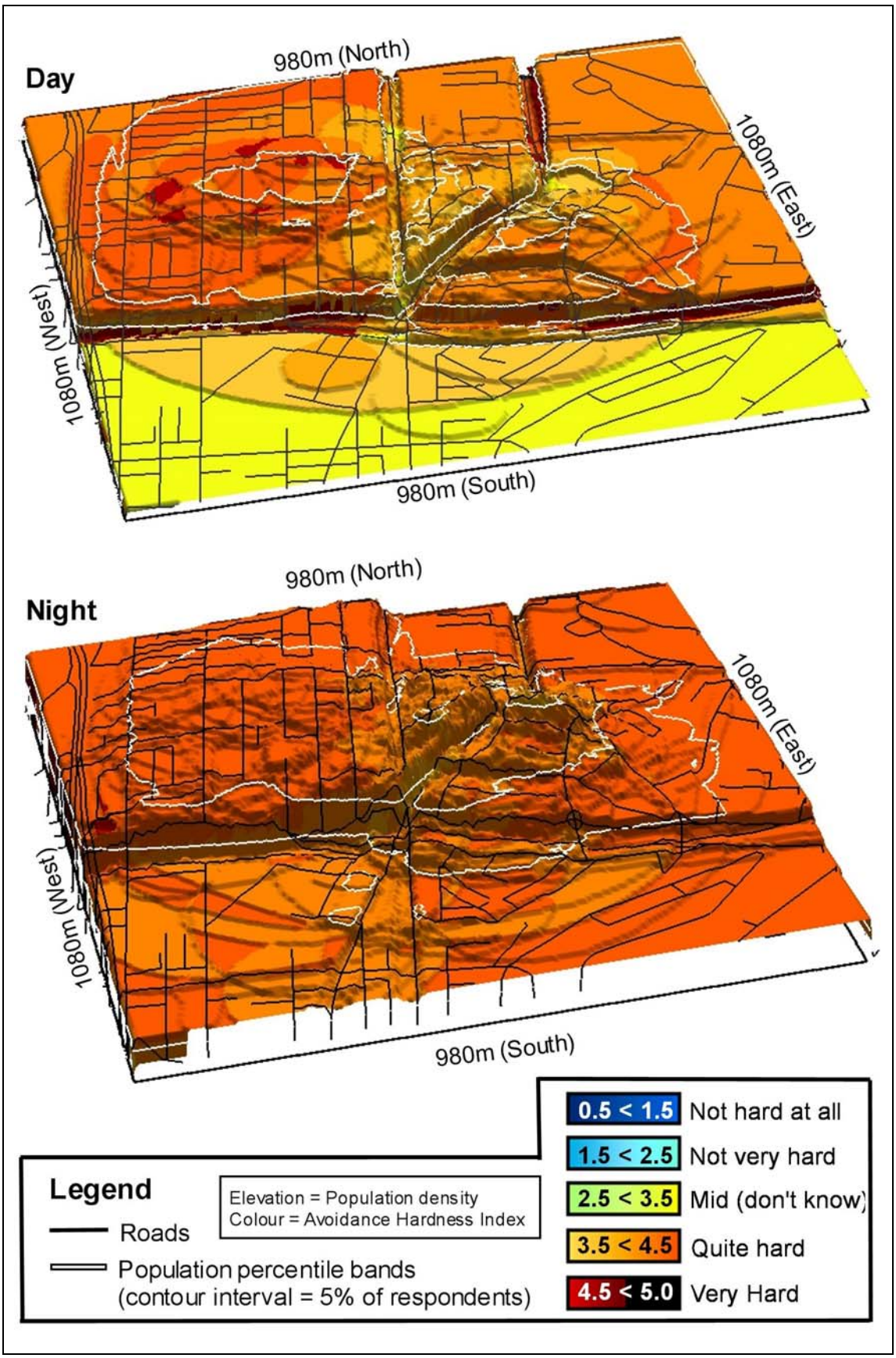


Figure 90. Areas where the respondents stated the presence of *AREAS TO HIDE* triggered their fear of being robbed, beaten or attacked – during the day and night.

10.5. Fear of crime due to the perceived presence of sex workers

This section shows and describes the fear maps illustrating areas the respondents avoided because the perceived presence of sex workers triggered their fear of being robbed, beaten or attacked. Overall patterns of avoidance are depicted for the day and night respectively (see Figure 91). The fear maps for the male and female respondents, and visitors and residents, follow the descriptions of these overall maps.

10.5.1. Avoidance during the day for all respondents

For *sex workers in* the day, avoidance is fairly constant over the entire study site, with two to three respondents avoiding most of the study site south and north of William Street. One to two respondents avoid William Street itself. Levels of avoidance in the other main streets of the study site are very similar to that in the surrounding areas. Between five and seven respondents avoid Darlinghurst Road, between two and five respondents avoid Victoria Street, and between one and three respondents avoid MacLeay Street.

Peak A is not evident, however avoidance in the Woolloomooloo region does increase to a height of six respondents near the Forbes and Stephen Street intersection. Peak B is also vague, reaching a point of eight respondents along the west side of Darlinghurst Road. Aggregate avoidance during the day was greatest over Peak C, which was avoided by a maximum of 11 respondents over Kellett Street. The gradient of Peak C increases more sharply within the area surrounded by Bayswater Road, Ward Avenue and Kellett Way.

10.5.2. Avoidance during the night for all respondents

Avoidance due to the presence of sex workers triggering respondent fear of crime significantly increased from the day to the night. The clear divide in avoidance density either side of William Street on the Drug users maps becomes evident on the *sex*

workers map for the night. Ten respondents avoid the lowest point north of William Street, whereas seven respondents avoid the lowest point south of William Street.

Like in the day map, Peak A is not really apparent. However, avoidance does gradually increase from 11 respondents near the study site boundaries to 20 respondents over a large area of Woolloomooloo. For sex workers, Peak B is slightly clearer on the night map than it is on the day map. Avoidance increases slowly from Springfield Lane and Victoria Street, to peak on the western side of Darlinghurst Road with 27 respondents. Peaks A and B are not separated by Victoria Street, which is avoided by 25 respondents near Earl Street and 10 respondents near Horderns Place. Similarly, Darlinghurst Road provides only a small partition between Peaks B and C, being avoided by between 22 and 26 respondents. Three fewer respondents than in the general surrounding areas avoid MacLeay Street.

Aggregate avoidance during the night was also greatest over Peak C, which was avoided by a 32 respondents at its maximum. The gradient of Peak C begins slowly at William Street, Darlinghurst Road, Roslyn Gardens and Baroda Street. Ten to 12 respondents avoided most of the remainder of the study site north of William Street because the presence of sex workers triggered their fear of crime. South of William Street, avoidance increased from seven respondents in the flanks of the study site up to 20 respondents where William Street and Darlinghurst Road meet. The Avoidance Hardness Index ranged from ‘Quite Hard’ to ‘Very Hard’ over the entire study site.

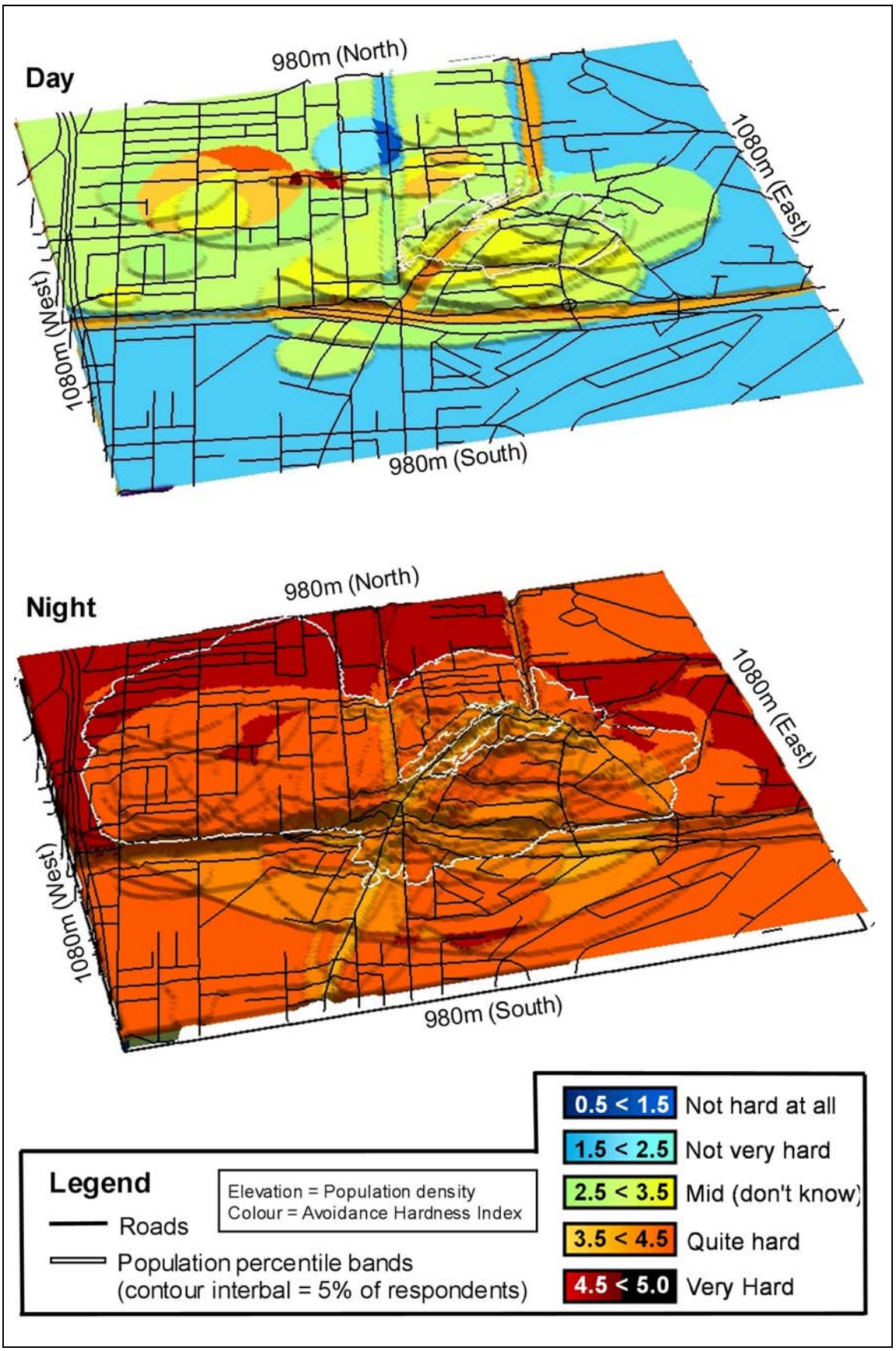


Figure 1. Areas where the respondents stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked – during the day and night.

10.5.3. Avoidance during the day and night for the male and female respondents

Figure 92 and Figure 93 indicate there are noticeable differences between the number of male and female respondents who avoided areas of the study site because the presence of sex workers triggered their fear of crime.

During the day, few male respondents adopted avoidance behaviour due to the presence of sex workers. Aggregate avoidance reached a maximum of five male respondents, who avoided an oval shaped area along Darlinghurst Road. Two male respondents avoided Woolloomooloo, one avoiding the entire suburb and the other avoiding a small area centering over Sydney Place. There were no male respondents who avoided the study site south of William Street or the majority of the study site east of Ward Avenue. The Avoidance Hardness Index ranges from 'Very Hard' over Woolloomooloo, to 'Not Very Hard' along Darlinghurst Road.

Comparatively more female than male respondents adopted avoidance behaviour in response to the presence of sex workers during the day. Aggregate avoidance was fairly constant over the entire study site, however was greatest over Peak C. Peak C was avoided by a maximum of nine females over Kellett Street. Most of the remainder of the study site was avoided by two females, with a maximum of five avoiding Darlinghurst Road and one avoiding William Street. For most of the study site the Avoidance Hardness Index was in the 'Not Very Hard' category. Avoidance Hardness increased to 'Mid' and 'Very Hard' in the street blocks either side of, and along, Darlinghurst Road.

Slightly more male respondents adopted avoidance behaviour due to the presence of sex workers during the night than the day. Aggregate avoidance was very constant over the entire study site. However, as in the day, avoidance was greatest either side of Darlinghurst Road, especially close to the Roslyn Street and Springfield Avenue intersections, which were avoided by a maximum of ten male respondents. Darlinghurst Road was avoided between four and seven males. Only one male respondent avoided the majority of the study site east of Ward Avenue and south of William Street, with most of the remaining area being avoided by two to three males.

For most of the study site the Avoidance Hardness Index was in the top range of the ‘Very Hard’ category, however it decreased to the ‘Mid’ category over Darlinghurst Road and Peak C.

For the female respondents, avoidance increased even more from the day to the night than with the male respondents. Aggregate avoidance for females during the night was highest over the eastern side of Darlinghurst Road, particularly over Kellett Street and Bayswater Road, which were avoided by up to 23 females. The western side and center of Darlinghurst Road was avoided by up to 21 and 18 female respondents respectively. Aggregate avoidance over Woolloomooloo reached up to avoiding 16 females. South of William Street, avoidance density ranged from six females in the flanks of the study site to sixteen in the middle where Darlinghurst Road and Victoria Street meet. For most of the study site, the Avoidance Hardness Index was in the higher range of the ‘Quite Hard’ category, with only a small area over Woolloomooloo in the ‘Very Hard’ category.

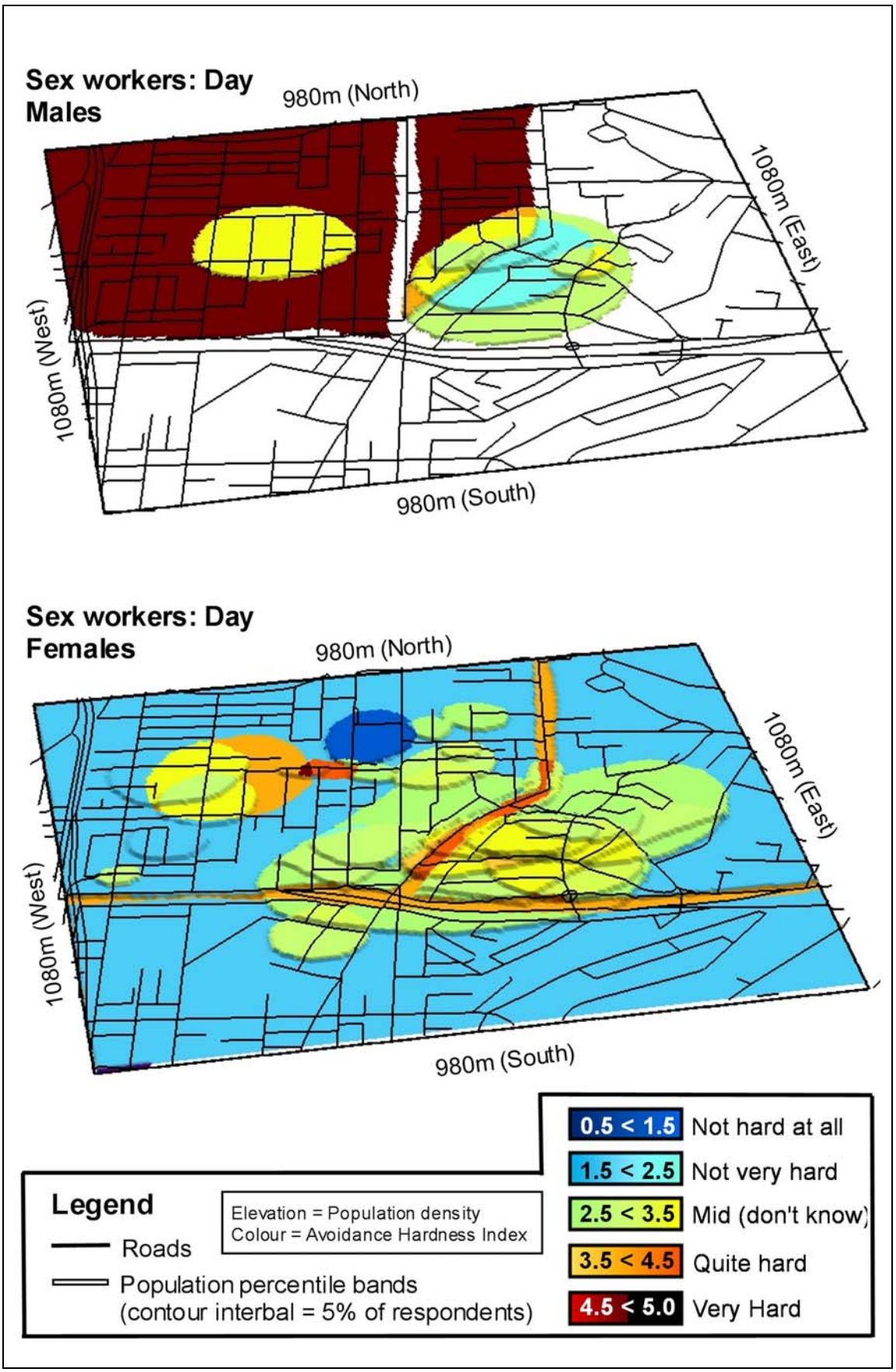


Figure 92. Areas the MALES and FEMALES stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked during the DAY.

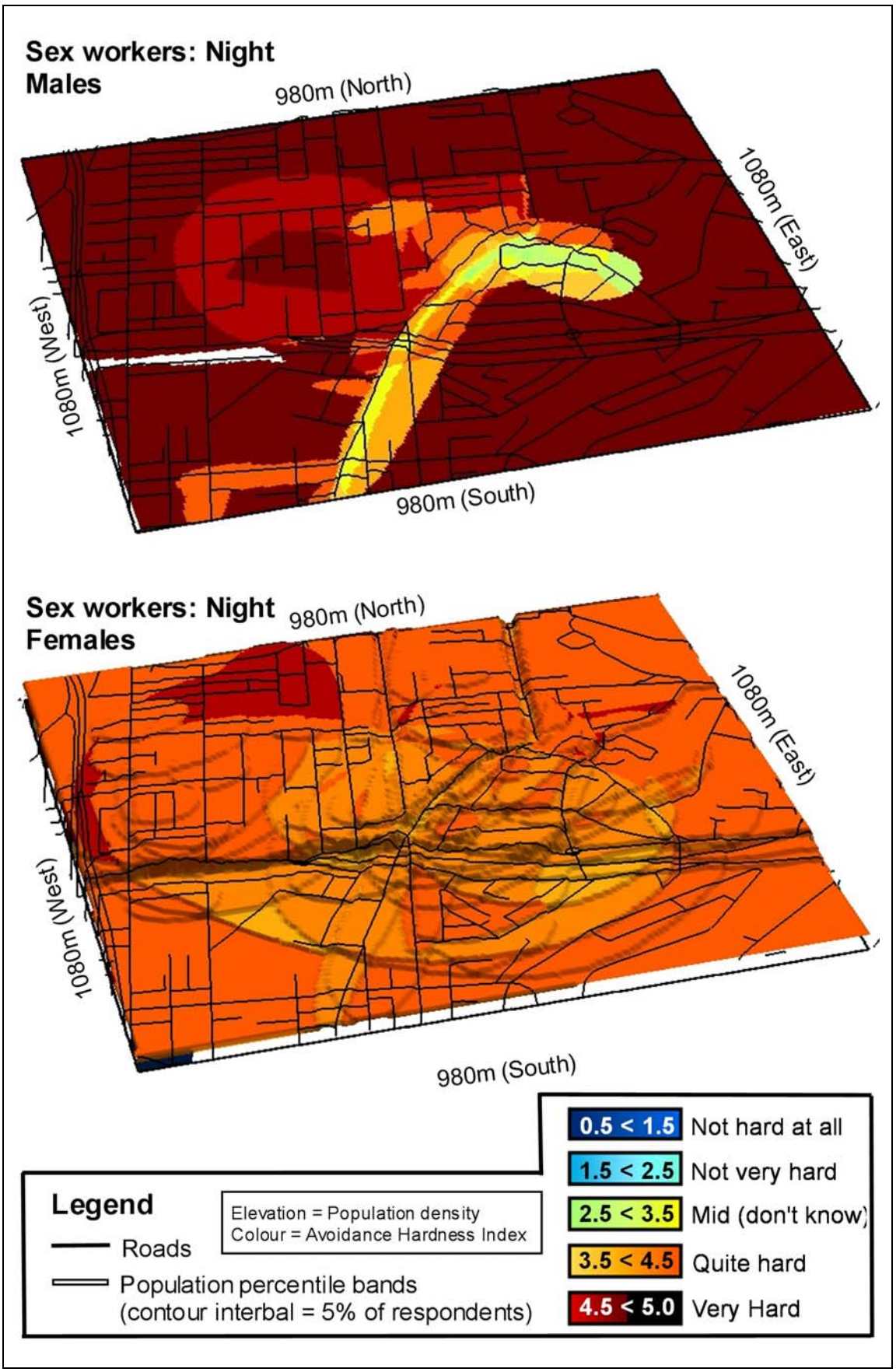


Figure 93. Areas the MALES and FEMALES stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked during the NIGHT.

10.5.4. Avoidance during the day and night for the residents and visitors

Figure 94 and Figure 95 indicate there are noticeable differences between the number of residents and visitors who avoided areas of the study site because the presence of sex workers triggered their fear of crime.

During the day, few residents adopted avoidance behaviour due to the presence of sex workers, with only small parts of the study site actually being avoided. Aggregate avoidance was at its limit alongside Darlinghurst Road with three and four respondents avoiding the western and eastern sides respectively. Small areas, avoided by one to two respondents, are also visible over Sydney Place and Peak B. The Avoidance Hardness Index ranged predominately from 'Very Hard' to 'Not Very Hard', with a small area south of William Street in the 'Mid' category.

More visitors than residents adopted avoidance behaviour in response to the presence of sex workers during the day. Aggregate avoidance was very constant over the entire study site, however was greatest over Blocks B (along the western side of Darlinghurst Road) and C (over Kellett Way), which were both avoided by a maximum of eight visitors. Four visitors avoided Darlinghurst Road, two avoided Victoria Street, and one avoided William and MacLeay Streets. Two visitors avoided most of the remainder of the study site. The Avoidance Hardness Index predominately ranged from 'Not Very Hard' to 'Mid', with one small area over Woolloomooloo in the 'Quite Hard' category.

Many more residents adopted avoidance behaviour due to the presence of sex workers during the night than the day. Aggregate avoidance by residents during the night was greatest in Peak C over Kellett Way. Peak C was avoided by between eight and 15 respondents. Peak B was avoided by between nine and 12 respondents. Darlinghurst Road was avoided by between eight and 10 respondents. Avoidance reached a maximum of eight residents over Woolloomooloo. South of William Street, avoidance increased from one respondent in the flanks up to four residents where William Street and Darlinghurst Road meet. The Avoidance Hardness Index

predominately ranged from ‘Quite Hard’ to ‘Very Hard’, with a small part of the study site falling in the top end of the ‘Mid’ category.

Avoidance due to the presence of sex workers also increased from the day to the night for the visitors. Aggregate avoidance during the night was greatest along Darlinghurst Road, with both sides avoided by a maximum of nineteen visitors. Avoidance reached a maximum of twelve visitors over Woolloomooloo. South of William Street, avoidance increased from six respondents in the flanks up to fourteen visitors where William Street and Darlinghurst Road meet. Seven to ten visitors avoided most of the remainder of the study site. The Avoidance Hardness Index over the entire study site ranged from ‘Quite Hard’ to ‘Very Hard’, with most of Woolloomooloo being in the ‘Very Hard’ category.

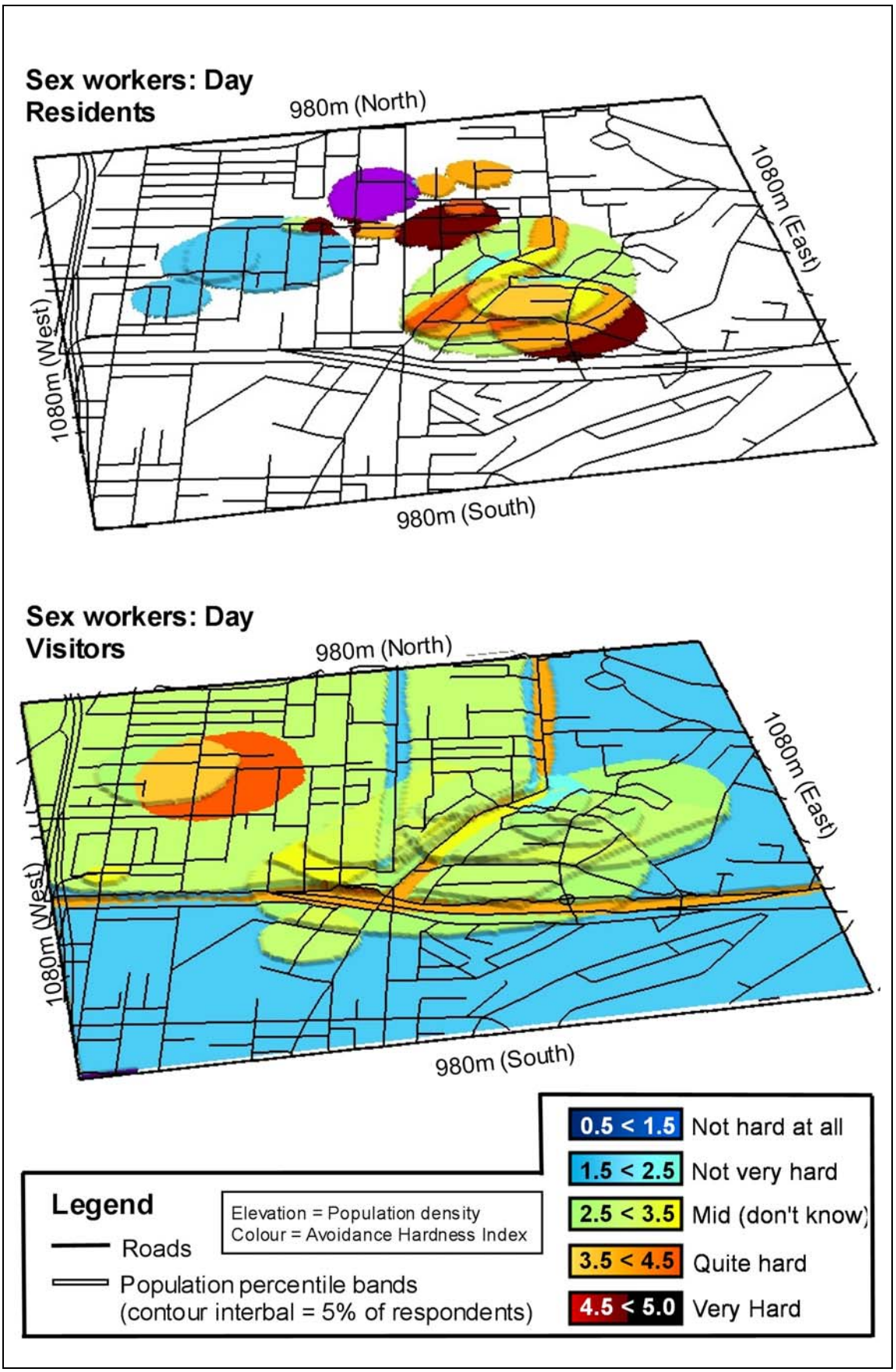


Figure 94. Areas the RESIDENTS and VISITORS stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked during the DAY.

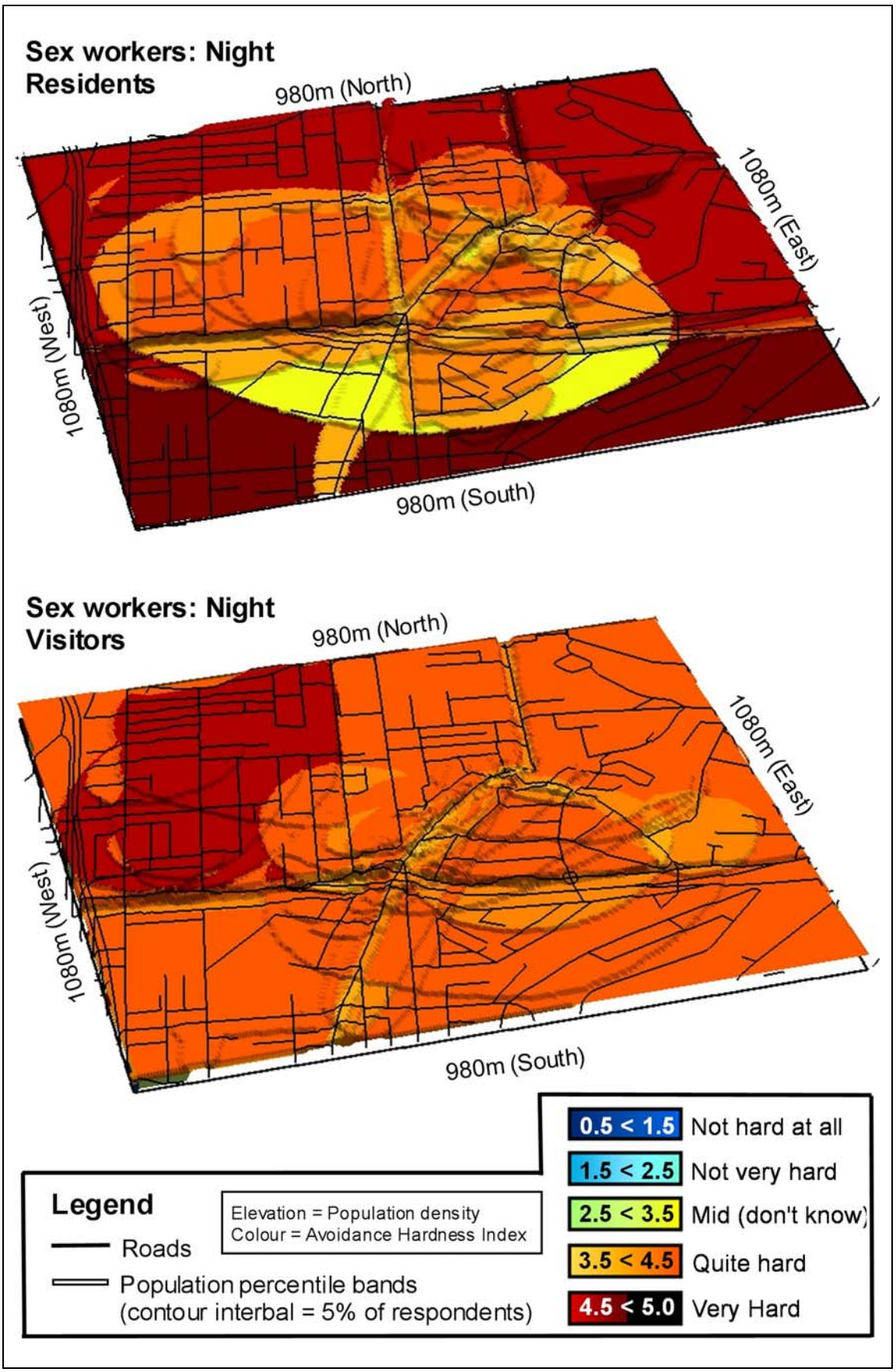


Figure 95. Areas the RESIDENTS and VISITORS stated the presence of *SEX WORKERS* triggered their fear of being robbed, beaten or attacked during the NIGHT.

10.6. Summary of the 3D avoidance maps results

This section presented final 3D avoidance mapping results. It consists of the spatial results relating to avoidance patterns triggered by the perceived presence of drug users, gangs, areas to hide and sex workers. The later part included a breakdown of the fear maps for the drug users and sex workers by residential status and sex of the respondents. As mentioned previously, these results are examined next in the Discussion chapter. Attention will be paid to implications of the results for policy, planning and practice.

11. Discussion and implications

This research used avoidance mapping to provide a spatiotemporal investigation into people's fear of being robbed, beaten or attacked. A survey of 399 respondents was carried out on the streets of Kings Cross to obtain the data examined in this research. A three-dimensional visual-diagnostic technique was developed to produce the avoidance maps. These maps show where, when and to what extent the survey respondents were afraid of crime.

The first three sections of this chapter broadly discuss the occurrence of fear of crime and avoidance in Kings Cross. Section 11.1 considers the general finding that people were afraid of crime in Kings Cross. Section 11.2 briefly looks at the aspatial research results that indicate which socio-demographic groups were most afraid of crime. Section 11.3 then looks at how avoidance levels differ between the day and night. These three sections do not provide a spatial investigation into the avoidance maps, which are subsequently discussed in more detail in the following chapter sections.

Referring to the avoidance maps, section 11.4 examines those areas where the respondents felt afraid of crime. An exploration of the 16 environmental cues that triggered the respondents to avoid these areas is consequently offered in section 11.5. The value of the avoidance maps in providing new information with useful implications for policy and planning is primarily put forward in these two sections. Section 11.5 also discusses the 3D avoidance maps for four selected environmental cues, drug users, gangs, areas to hide and sex workers. Included is an assessment of the drug users and sex workers avoidance maps that show avoidance levels according to the sex and residential status of the respondents. The specific findings resulting from these avoidance maps are also discussed in light of their practical implications. Lastly in section 11.6, the benefits and limitations of the research are presented before the final thesis conclusions and recommendations in the concluding chapter.

11.1. People are afraid of crime

The study results verify that people are afraid of being robbed, beaten or attacked in Kings Cross and do avoid parts of Kings Cross because of this fear. Specifically, 36% (day) and 66% (night) of the respondents indicated that they avoided areas of the study site because they were afraid of being robbed, beaten or attacked during the day and night respectively. This finding is consistent with Darcy's (2003) study, which despite different research methods, found that 62% of respondents felt unsafe in the Kings Cross LAC. Likewise in Wollongong, Doran (2004) found that 55% of respondents felt either 'very unsafe' or 'not safe at all' when walking alone in the city, and that 39% (day) and 81% (night) of respondents actually avoided parts of the CBD during the day and night respectively. Given the fact that crime levels are higher in Kings Cross than in Wollongong, it is somewhat surprising that avoidance levels, in terms of overall percentage of avoiding respondents, are higher for Wollongong than Kings Cross.[201] This finding reflects the signal crimes perspective, which concludes that fear of crime depends on the situational context of the study region and the presence of environmental cues within it, as discussed in section 2.2.4.3 of the literature review. Regardless, the levels of fear found in Kings Cross are high and it is possible that they are underestimated given the probability that the most fearful members of society could not be interviewed due to the street-based interviewing approach.[202] While this study does not suggest that these research findings will be true for the wider population, they do indicate a large proportion of residents of, and visitors to, Kings Cross could be avoiding parts of the region due to fear of crime.

Drawing on the literature reviewed in section 2.3, these high levels of fear and avoidance could have numerous negative consequences for affected individuals and the Kings Cross neighbourhood. For instance, the economic growth of the area may be being hindered through reduced numbers of business patrons. Fear of crime and avoidance may also be disrupting neighbourhood cohesion and the sense of community amongst Kings Cross residents. Likewise, it could be creating opportunities for disorderly behaviour and serious crime because of the potential reduction in natural

[201] This study used the same initial mapping question as used by Doran (2004), "*Do you avoid any areas in Kings Cross/Wollongong because you are afraid of being robbed, beaten or attacked?".*

[202] This is discussed latter in section 11.6.2.2 of the chapter.

surveillance and social control, which could further encourage greater levels of fear and avoidance. While it is not definite that this will occur, the potential for these and other problems seem to warrant action be taken to address fear of crime in Kings Cross.

The finding that avoidance due to fear of crime occurs in Kings Cross, could validate and encourage the implementation of police, government and community fear of crime reduction strategies. For example, it promotes the continuing of broad government initiated strategies like The City's 'Safe City Program'. This is a collaborative approach between council, police and community organisations that focuses on crime prevention and making the community a safer place (CoSC, 2006i). [203] The high fear levels evident from this research suggest a local plan would additionally be suitable for the Kings Cross neighbourhood. Such a plan could be similar to The City's Community Safety Plan for Redfern-Waterloo, which for example encourages developers to follow CPTED principles in their development applications (CoSC, 2004a). The fear of crime literature also proposes that information about actual crime levels or rates can reduce fear of crime. Considering this, the results also endorse joint police, government and community efforts like The City's Community Safety Education campaigns (CoSC, 2006h). Government departments, like the NSW Bureau of Crime Statistics and Research, could distribute information from their crime statistics and mapping reports through such campaigns. This information could include supplementary material police on local safety initiatives, how to protect personal property from theft, and improve personal safety (CoSC, 2006h; CoSC, 2006g).[204] Specific crime information for Kings Cross could be also included in The City's *A Safer Community* newsletter and Kings Cross' *Cross Lights* magazine (CoSC, 2006g).[205]

Many of these types of generalised fear of crime reduction strategies evolve simply from the knowledge or assumption that fear of crime exists in a community. This is because the scope of most fear of crime surveys is limited to a question resembling 'are you afraid of crime?' As summarised in section 2.4.2.1 of the literature review chapter,

---

[203] Safe City initiatives include the development of licensing accords to address under-age drinking and anti-social behaviour in and around licensed venues, the development of a comprehensive Syringe Management Strategy, and the implementation and use of Closed Circuit Television (CCTV) (CoSC, 2006i).

[204] The materials take various forms including newsletters, drink coasters, bookmarks, stickers and posters and are distributed in venues such as licensed venues, food-courts and libraries (CoSC, 2006j; CoSC, 2006k; CoSC, 2006l).

[205] It does not appear that this newsletter survived passed it's first edition in June 2005.

most studies then use traditional statistical methods to determine which socio-demographic groups are most afraid of crime. While such an analysis was subsidiary to the main spatial component of this study, the general research findings regarding fear levels experienced by different socio-demographic groups are described next.

11.2. Who is afraid of crime?

Knowing which socio-demographic groups are afraid of crime typically enables researchers to hypothesise why this may be and practitioners to target vulnerable groups in fear reduction strategies. This study does not discuss the implications of knowing who is afraid of crime. Instead it briefly explores how avoidance mapping can reveal variation in the level of fear of crime experienced by different socio-demographic groups, thereby providing additional information not available through traditional statistical analysis methods. The results from a traditional chi-square analysis are displayed in Table 10 on page 153 of section 5.1.2.2.a to allow comparison with the avoidance mapping results, which are discussed later in section 11.5.

Table 10 shows that only one of the five socio-demographic variables was associated with fear of crime. There was no significant association between fear of crime and age, housing tenure type, income or residential status.[206] In contrast, the respondent's sex was strongly related to fear of crime (p=0.0057), with females being more fearful than males. The results show that 43% of females and 29% of males indicated that they had felt fearful when walking in Kings Cross. In terms of avoidance, 45% (day) and 82% (night) of women avoided one or more areas in Kings Cross during the day and night respectively, as opposed to 25% (day) and 63% (night) of men. This finding is discussed in sections 11.5.1.3.b and 11.5.3.2.b on the patterns of avoidance adopted by men and women in response to the perceived presence of drug uses and sex workers in Kings Cross.

In addition to determining which socio-demographic groups are most afraid of crime, many studies also differentiate between fear levels experienced during the day

[206] This finding should be noted when reading sections 11.5.1.3.a and 11.5.3.2.a, which discuss the patterns of avoidance adopted by the residents and visitors in response to drug uses and sex workers.

and the night to help in understanding the nature of public fear of crime. This study also included such a temporal component, which is discussed next.

11.3. When are people afraid of crime?

The research results indicate that the overall level of fear of crime and avoidance during the night (66%) was nearly double that during the day (36%). The finding that fear of crime is greater during the night than the day is consistent with the results from other fear of crime studies. These studies typically report that fear is increased during the night and draw on assumed changes in the environment to hypothesise why. However, this study also investigated those environmental cues that trigger fear of crime, which can be used to confidently explain why fear of crime is greater during the night than the day.

A marked increase in fear of crime between the day and the night was apparent when looking at the avoidance levels triggered by each of the 16 environmental cues (see Table 13). This temporal change was most pronounced for poor street lighting, with avoidance during the night nearly tripling that during the day, which suggests that the change in the physical environment from light to dark plays a significant role in heightening fear of crime. Such a finding supports the literature discussed in section 2.2.4.2, which proposed that fear of crime is amplified during the night because darkness causes a reduction in visibility and the creation of blind spots, shadows and potential places of entrapment (Painter, 1996). The results therefore point towards the need for improved street lighting to reduce fear of crime in Kings Cross. This is discussed further when the avoidance maps are examined in section 11.5.2.1.

Table 13. Temporal changes in avoidance levels for the 16 environmental cues, by percentage of all respondents

Environmental cue	***Percent adopting avoidance during the day***	***Percent adopting avoidance during the night***	***Temporal change in avoidance percentage***
Drug users	23.0	42.5	19.5
Spruikers	7.9	16.3	8.4
Homeless people	11.8	20.2	8.4
Intoxicated persons	19.4	36.5	17.1
Sex workers	6.3	13.1	6.8
Gangs	20.5	37.3	16.8
Loitering people	15.5	30.1	14.6
Pedestrian absence	12.1	24.1	12.0
Poor street lighting	12.9	34.6	21.7
Vandalism	8.9	18.9	10.9
Rubbish/syringes	16.0	32.0	16.0
Rundown/abandoned buildings	9.2	21.3	12.1
Offensive/degraded shops	7.6	16.8	9.2
Areas to hide	14.2	28.1	13.9
Blocked escape	12.6	23.6	11.0
Laneways	16.3	32.8	16.5

Many studies conclude their temporal component of the research by stating that fear of crime increases during the night and that this increase is due to the onset of darkness and absence of adequate street lighting. However, these studies are limited by excluding an examination of how other environmental cues may trigger different levels of fear during the day and night. This research demonstrates the benefits of considering other environmental cues in fear of crime investigations, for example Table 13 additionally shows that avoidance during the night more than doubled that during the day for spruikers, sex workers, vandalism, rundown/abandoned buildings and offensive/degraded shops. Table 13 also shows that avoidance during the night doubled that during the day for pedestrian absence and rubbish/syringes and nearly doubled that during the day for intoxicated persons, loitering people, areas to hide and blocked

escape. These findings reflect Koskela's (1999) hypothesis that fear of crime increases during the night because of changes in the social environment. This suggests that strategies designed to reduce night-time levels of fear in Kings Cross should not be limited to the improvement of poor street lighting but should also encompass these other environmental cues. These environmental cues and the effect they have on public fear of crime are discussed in more detail in section 11.5.

The aspatial results from this study have established that people are afraid of crime in Kings Cross, that the sex of the respondent is strongly associated with fear of crime and that fear of crime increases during the night. However, this study is primarily about avoidance mapping and the additional information it provides on where and why people are afraid of crime. This extra information, which is not generally obtained in fear of crime studies, proves to be even more useful for combating fear of crime. This is discussed in the next two sections.

11.4. Where are people afraid of crime?

This study specifically examines where people are afraid of being robbed, beaten or attacked in Kings Cross. By developing a visual-diagnostic technique for mapping collective avoidance, the study found there are common patterns of avoidance throughout the study site, and that fear of crime in Kings Cross occurs in noticeable hotspots. The evidence that specific microlevel hotspots of fear do exist in this high crime area is consistent with other fear mapping examples, for instance Darcy's (2003), Doran and Lees' (2003) and Fisher and Nasar's (1992, 1995) studies. Information regarding the whereabouts of these fear hotspots in Kings Cross has useful implications for policy and planning in the region, especially given that The City aims to identify safety issues and crime 'hotspots' and design strategies to improve crime and safety (CoSC, 2006m). The City refers to the South Sydney Plan of 1997 and the Urban Design Study of 2006 when providing recommendations for their latest City Plan (AJC, 2006). This section of the chapter examines overall avoidance patterns in the study site, as well as the implications of the maps for policing and the City's development plans and policies.

11.4.1. Three fear of crime hotspots

The overall avoidance maps have revealed three fear hotspots in the study site. These are distinct spaces that have a noticeably high level of avoidance when compared to avoidance levels in the surrounding areas. The avoidance maps on pages 200 to 226 show avoidance in Kings Cross predominates:

- over central Woolloomooloo (Peak A);
- in the street block bordered by Victoria Street, Orwell Street and Darlinghurst Road (Peak B); and
- in the street block bordered by Darlinghurst Road, Bayswater Road, Roslyn Street and Ward Avenue (Peak C).

Knowing where the hotspots are generally located has practical implications, as police from the Kings Cross LAC can direct their resources to these three areas. This could include focussing police beats or neighbourhood watch programs in these areas to reassure the community and actively participate in crime prevention. These areas can also be compared with sites of crime to verify police knowledge of areas of high levels of recorded crime or potentially alert them to areas of unrecorded crime (Burgess, 2004). These general findings are discussed further, in more detail, under the headings of the City 'neighbourhoods' that are located within Kings Cross. The discussion also brings into account implications for council development plans and policies.

The maps show that William Street acts as a divide separating areas that trigger high levels of avoidance (north-side) from those areas that do not (south-side). Brantingham and Brantingham (1993) propose that people include perceptual edges in their cognitive maps to indicate the spatial limits of high crime areas. The avoidance maps demonstrate that such edge effects exist and that they influence how hotspots of crime and fear are cognitively defined, with people commonly perceiving William Street as a physical barrier between safe and unsafe areas. As discussed in section 2.4.2.2.a of the literature review, the maps also provide evidence that such phenomenon do affect peoples' spatial choices and behaviours. Brantingham and Brantingham (1993) suggest that edges have increased levels of crime because they represent the limits of territoriality and the surveillance or identification of strangers who may commit crime. However, given the fact that visitors frequent the suburbs to the north

and south of William Street, it is unlikely that this is the cause of the change in fear and avoidance levels. More likely, it is perceived changes in crime levels, environmental cues, landuse types and demographic characteristics that influence levels of fear and avoidance. For example, those suburbs immediately to the north of William Street have higher crime levels, more signs of disorder, a higher density of adult entertainment premises and lower average incomes than the suburbs to the south.

The avoidance maps additionally establish that Darlinghurst Road[207], Macleay and Victoria Streets are considered as distinctly safe thoroughfares through the three fear hotspots. This finding is interesting given that most signs of disorder, robbery incidents and assault incidents in Kings Cross occur along Darlinghurst Road.[208] In line with this, Brantingham and Brantingham (1993) comment that crime is concentrated along high activity pathways, like Darlinghurst Road, that are frequented by people traveling to work, shopping centers and entertainment premises. The research results suggest that although Darlinghurst Road is high in crime, the fact that it is a major pathway with the attractions of transport, shopping and entertainment, may mean peoples' levels of fear of crime are not great enough to warrant avoidance behaviour. It could also indicate the presence of signs of safety or cues that counteract feelings of fear. Further research into why high crime pathways may have low levels of fear will help with CPTED efforts. However, this information is still practical for policing because it tells the police that they may not need to concentrate their efforts in these streets to address fear of crime. Nevertheless, the presence of actual crime and disorder does mean it is likely these streets, Darlinghurst Road in particular, should remain the focus of police attention. This is also discussed more in the next section.

11.4.2. Fear of crime in the Kings Cross neighbourhoods

As outlined in the research setting section, there are six neighbourhoods in the Kings Cross study site. North of William Street these neighbourhoods include Woolloomooloo (encompassing Peak A), Kings Cross (encompassing Peaks B and C,

[207] This result is contrary to what was found in Darcy's (2003) fear mapping study. In Darcy's study the respondents felt most unsafe, because of the presence of *drug users*, along Darlinghurst Road north of William Street (Darcy, pers com, 5/4/04). However, it is important to remember there were very different measurement and analysis approaches used in this study.
[208] This is indicated in section 4.5 of the research setting chapter.

and part of Darlinghurst Road and Macleay Street), Potts Point and The Bays. South of William Street, these neighbourhoods include Darlinghurst West and Darlinghurst East.

11.4.2.1. Woolloomooloo

Overall avoidance levels were high in Woolloomooloo, with one of the three major fear hotspots in the study site being over Sydney Place, central Woolloomooloo. This result suggests the need for development and maintenance of the area to encourage greater public usage. The overall avoidance maps show that up to 11% (day) and 29% (night) of all respondents avoided this area during the day and night respectively, compared to under 5% for the study site south of William Street. The City's redevelopment plans for Woolloomooloo focus on maintaining the quiet residential atmosphere that currently defines this neighbourhood (AJC, 2006). The City identifies Plunkett Street Public School, which is largely situated in the middle of the avoidance peak, as the heart of Woolloomooloo. According to The City, the landscape around the school, which "contributes vegetation and semi-publicly accessible open space in a densely built area", will be maintained (AJC, 2006). However, the research results show that if fear is to be addressed this landscape should not be maintained as is and that new development plans should consider the reduction of fear of crime in the area.

Such development is planned along Cowper Wharf Roadway, with the reinforcement of a tourist area with cafes, restaurants and pubs to encourage the public into Woolloomooloo. The City suggests a mixed-use corridor on the western side of Bourke Street to connect pedestrian activity at Cowper Wharf Road with Cathedral Street. However, the overall avoidance maps show avoidance is low over Bourke Street, indicating that a pedestrian network through the more heavily avoided McElhone (in particular), Dowling or Forbes Streets would be more suitable if fear of crime is to be considered. Similarly, The City will encourage pedestrian activity through a mixed land use corridor south of Cathedral Street along Bourke and Forbes Streets, connecting to William Street. Again in terms of fear of crime, avoidance levels indicate that McElhone, Dowling or Forbes Streets, in that order, would be better choices than Bourke Street for development.

The City Plan recognises a need for the development of vacant lots along Palmer Street and the Eastern Distributor, which are located on the western edge of the study site (AJC, 2006). However, the research results show that overall avoidance is low along these streets. Consequently in terms of fear reduction, they should not be a development priority when compared to more publicly feared areas. Of the 16 environmental cues, rundown/abandoned buildings were ranked 12th during the day (with 25% of respondents indicating they triggered their fear of crime) and 11th during the night (32% of respondents). These indicate that vacant lots, or rundown/abandoned buildings, are not the most imperative environmental cues to be targeted. Furthermore, an assessment of the specific avoidance maps for these cues reveals that people are not avoiding Palmer Street and the Eastern Distributor because the presence of rundown/abandoned buildings trigger their fear of crime (see Figures 137, 151 and 165 in Appendix B). Despite this, The City may choose to address these cues for reasons other than fear of crime.

The rail corridor through Woolloomooloo is evident on the overall avoidance maps, particularly during the night. While fear is generally high in Woolloomooloo, avoidance noticeably increases over, and to the north of, the rail corridor. This is especially pronounced at the viaduct near Judge and Cathedral Streets. The City proposes that the rail corridor, which currently has safety and security issues, will become more open so there is greater spatial definition, more activity along its edges and surveillance (AJC, 2006). The spaces under the railway viaduct will be re-landscaped to provide increased amenity and visual improvement (AJC, 2006). The research results endorse these development plans.

Proposed developments include pedestrian footpath widening, paving, planting and angle parking in Cathedral, Dowling, Forbes and Bourke Streets. Where possible, the avoidance map results also suggest such improvements in McElhone Street, Stephen Street and Sydney Place. A public square at the end of Cathedral Street that continues a walking route along McElhone Street to Kings Cross is also included in the proposed development (CoSS, 1997a). This proposal appears like an appropriate plan for promoting pedestrian activity through this heavily avoided area.

11.4.2.2. Kings Cross

Avoidance in the study site is greatest in the Kings Cross neighbourhood, which locates the two other fear hotspots, Peaks B and C. The overall avoidance maps show that up to 30% of all respondents avoided the Kings Cross neighbourhood during the night. Avoidance during the day was up to 15% percent of all respondents. The City intends that Kings Cross continue to be an entertainment district that attracts local and global visitors (AJC, 2006). Commercial and retail activities will be encouraged, particularly daytime attractions and "better quality retail" (AJC, 2006). The City hopes this will improve commercial viability so that Kings Cross becomes a catchment area for City East shoppers (AJC, 2006). However, the research results show that Kings Cross is losing a very large number of potential customers. Therefore while developing commercial activity will be a positive force in encouraging pedestrian usage, more attention needs to be given to those environmental cues that are triggering fear and avoidance behaviour in the first place.

Darlinghurst and Bayswater Roads are considered priority areas for improved retail activity (AJC, 2006). While this may be valuable, the maps show that there are other streets in the neighbourhood that might be more appropriate for development in regards to fear of crime. The overall avoidance maps show that during the day and night respectively, 5% and 20% fewer respondents avoid Darlinghurst Road than the surrounding areas. It appears that Darlinghurst Road is considered a safe thoroughfare through the two fear hotspots. If combating fear of crime is a priority objective, the streets that make up these more heavily avoided areas should therefore have development priority over Darlinghurst Road. More people avoid Bayswater Road, which forms part of Peak C, than Darlinghurst Road. The overall avoidance maps show that while the base of Peak C extends to William Street in the south, avoidance becomes much more pronounced north of Bayswater Road. With high levels of avoidance, the results confirm Bayswater Road is an appropriate site for development, particularly along the northern footpath. Upkeep is also recommended for the lanes that make up Peak C north of Bayswater Road, such as Kellett Street and Ward Avenue.

The City has identified most of the streets that make up the fear hotspot Peak B as streets in need of redevelopment. Orwell Street, which provides the northern boundary

of Peak B, is designated as the Kings Cross Town Centre and accordingly retail activity is to be encouraged there (AJC, 2006). The City hopes that improved retail activity will also promote surveillance of Orwell Street's small park and a proposed pedestrian link between Darlinghurst Road, Macleay Street, Llankelly Place and Victoria Street. The avoidance maps confirm that redevelopment of these areas, particularly Llankelly Place, which extends into the centre of Peak B, is essential in order to encourage avoiding pedestrians into this fear hotspot. The maps further indicate that the proposed pedestrian link could also include Mall Place, another heavily avoided street.

Also within the fear hotspot Peak B, is The City designated Village Centre and Plaza, which are situated on Springfield Avenue near its intersection with Earl Place. The City aims to improve activity along Springfield Avenue and Plaza by promoting development with active edges and outdoor eating. The avoidance maps show that avoidance is very high over this area and suggests this redevelopment is vital. The redevelopment could also extend into Earl Place and Earl Street, in the heart of the hotspot. Outdoor eating is additionally encouraged throughout this neighbourhood to activate the street life and provide opportunities for natural surveillance (AJC, 2006; CoSS, 1997a). The fear of crime literature and research findings suggest this is an appropriate idea.[209]

The City has also identified Victoria Street as an entertainment precinct (AJC, 2006). The overall avoidance maps indicate that in regards to fear of crime, Victoria Street is not a priority street for redevelopment, as it does represent a safe thoroughfare through Peaks A and B. However, it is still avoided by a large number of people during the night and should also be considered in development plans. The City will target Lawrence Hargrave Park for improved safety and security, by enhancing its role within the open space network and improving its presentation. However, Lawrence Hargrave Park was not identified as part of the fear hotspots with avoidance being comparatively

[209] Using other means, The City plans to encourage opportunities for surveillance throughout the City East. This is proposed by: maintaining the mix of landuses so there is 24-hour surveillance along major streets; lighting pedestrian pathways with vandal proof fixtures; having public open spaces that are well lit and have clear sightlines; signage describing pathways and facilities, for example taxi ranks and bus stops; provision for Help Points; active uses and frontages around public open spaces; building entry points that are readily identifiable, clearly visible and well lit; and building that are designed to minimise entrapment spots and have openings in all walls that have frontage to a public area (AJC, 2006; CoSS, 1997).

low. Therefore when considering fear of crime, these improvements would be more suited to the areas mentioned above.

11.4.2.3. William Street

While the avoidance maps show William Street is not heavily avoided, avoidance does occur on the northern sidewalk.[210] The City of Sydney continues earlier visions of the City of South Sydney's William Street Revitalisation Strategy. The aim is to develop William Street as a pedestrian orientated boulevard linking the City to Kings Cross (AJC, 2006).[211] To do this, public spaces will be enhanced by removing visual and physical barriers, installing high quality street furniture and planting trees (CoSS, 1997a). On the northern side of William Street, trees will be planted as close to the street edge as possible. On the southern side, trees will be grouped to define spaces or corridors, rather than enclose or fill up public spaces or obscure views (CoSS, 1997a). These redevelopments along William Street are a good idea to improve the attractiveness of the entire region for pedestrians, particularly the northern half of the study site. However, the planting of trees should be carried out strategically so that they do not create areas to hide or entrapment spots. This should also be considered when planning the tree planting proposed throughout the City East (AJC, 2006).

11.4.2.4. Potts Point

Avoidance over the Potts Point neighbourhood, in the north of the study site, was low. The City identifies Challis Avenue and Macleay Street as the main streets in the neighbourhood centre and plans for retail improvements to be carried out (AJC, 2006). However, the avoidance maps show avoidance is minimal in these streets. In comparison, overall avoidance is high near Hughes Street. Therefore in terms of fear of crime, developments that complement the improvements planned for the Kings Cross neighbourhood along Orwell Street, would be more appropriate on Hughes Street than Challis Avenue and Macleay Street. Similarly, improvements to Hughes Lane,

[210] It is unclear whether the survey respondents intended to include William Street's northern footpath in the areas they avoided north of William Street.
[211] The East Sydney Neighbourhood Association Inc (ESNA), a community based organisation, supports the vision for William Street to become a "grand civic boulevard and an important city gateway" (ESNA, 2002).

Tusculum Street and Manning Street, which could provide a pedestrian network to Macleay Street, may be more beneficial.

11.4.2.5. The Bays

The Bays cover the north-eastern side of the study site, where avoidance was very low. In this region, The City plans on strengthening the neighbourhood centres at Elizabeth Bay and Bayswater Roads, the convenience shops on Roslyn Avenue, and the small offices on Greenknowe Avenue (AJC, 2006). These improvements might be positive in acting to encourage pedestrian activity. However, when comparing the region to the fear hotspots in the study site, streets in the Kings Cross and Woolloomooloo neighbourhoods should have development priority as far as fear of crime is considered.

11.4.2.6. Darlinghurst West and Darlinghurst East

Darlinghurst West covers the south-western side of the study site. In this neighbourhood, The City plans that Darlinghurst Road and Victoria Street continue to be the predominant retail areas with entertainment also encouraged between Liverpool and William Streets (AJC, 2006). Fear in this latter region was higher than in the surrounding areas, particularly north of Tewkesbury Avenue. Redevelopments in this area will therefore be important in promoting pedestrian use. For Darlinghurst East, in the southeastern side of the study site, The City focuses it's development plans on McLachlan Avenue and Boundary Street (AJC, 2006). The avoidance maps showed these two streets were not avoided and therefore should not be a priority for development focussing on fear of crime.

11.4.3. Section synopsis: Implications for policy, planning and practice

The avoidance mapping has successfully revealed three main fear hotpots in Kings Cross. It has pinpointed specific streets and parks that have comparatively high or low levels of avoidance. In doing so, the maps have provided useful knowledge for policy,

planning and practice and allowed specific management recommendations to be made based on the research findings. Knowing where fear of crime occurs is clearly useful for gentrification of the area. With the solid evidence base provided by the avoidance mapping, fear of crime can legitimately become a consideration of councils when devising and revising their development plans. In terms of fear of crime, high fear areas can be prioritised for development and likewise, the need for development in low fear areas reassessed. A detailed look at fear of crime and The City plans has indicated that avoidance in some areas could be adequately addressed through existing development plans and that development proposed in some low fear areas would be more suitable in neighbouring high fear areas. However, while recommending such changes to current City development plans and policies in light of the research results, it is recognised that crime and fear of crime are not their sole focus.

In terms of practice, operational policing could be much improved by avoidance mapping and the knowledge it provides. The combating of fear of crime through the identification and targeting of fear hotspots can be worked into a variety of the policing models adopted by different departments. Of key relevance is the problem oriented policing, zero tolerance, community oriented and reassurance policing models. By doing so, the police can not only target fear of crime in its own right, but also possibly predict future locations of crime and prevent crime. This is particularly important as police continue move from traditional retrospective policing to proactive and preventative policing. Likewise, it encourages the recognition of community needs and response to disorder in addition to violations of criminal law.

11.5. Why are people afraid of crime?

This study is primarily exploratory research into the environmental cues that trigger people to feel afraid of being robbed, beaten or attacked in Kings Cross. Knowing which environmental cues are most likely to trigger fear of crime has promising implications for policy and planning. For example, allowing limited public resources to be validly directed towards combating the most pertinent environmental cues that trigger fear. This section will briefly discuss each of the 16 environmental cues

examined in this study.[212] The environmental cues are presented in order from the most to the least likely to trigger fear of crime. The four environmental cues selected for 3D mapping, drug users, gangs, areas to hide and sex workers, are also thoroughly discussed in this section in relation to existing and future City of Sydney development plans.

11.5.1. The environmental cues that triggered the most fear of crime

Drug users, gangs and intoxicated persons triggered the most fear of being robbed, beaten or attacked.[213] Both drug users and gangs were selected for 3D mapping. Hence they necessitate a more comprehensive discussion following this preface.

11.5.1.1. Three top ranked environmental cues

It is not surprising that drug users[214] and intoxicated persons[215] triggered the most fear of crime, as Kings Cross has a distinct history of problems associated with these social groups. In fact, The City readily acknowledges that some areas surrounding Kings Cross have serious drug and alcohol related issues that compromise the ability of public spaces to be attractive places "to work, live and recreate" (AJC, 2006; CoSC, 2006d; CoSC, 2006e; CoSC, 2006f). Similarly, the East Sydney Neighbourhood Association (ESNA) identifies one of the main problems for pedestrians as being "personal risk from drug dealers and associated criminal elements, drugged street sex workers and their minders" (ESNA, 2002).

---

[212] The environmental cues are not discussed with reference to findings from previous studies examining the link between environmental cues and fear of crime. This is because comparisons between studies are problematic due to vastly varying research methods. For instance it is unlikely the environmental cues would have the same affect on the formless levels of fear examined in most studies, as on the levels of avoidance examined in this research. Therefore comparing the results is somewhat ineffective.

[213] These results also reflect those from Darcy's (2005) study in 2003, which found *drug users/homeless* were ranked as the most common reason for making the public feel unsafe, and *spruikers/intoxicated persons* as the third most common reason (of 10 cues). Nevertheless, it is important to note the very different research approaches used in these two studies.

[214] Drug users triggered fear of crime in 64% (day) and 64% (night) of the avoiding respondents.

[215] Intoxicated persons triggered fear of crime in 54% (day) and 55% (night) of the avoiding respondents.

The City has developed specific policies and plans in order to deal with drug and alcohol related issues, for instance the 'Drug and Alcohol Strategy 2006-2011' (CoSC, 2006g). In terms of intoxicated persons, The City takes a comprehensive approach to combating alcohol related harm, anti-social behaviour and crime in and around licensed premises (CoSC, 2006a).[216] For example The City has exercised Alcohol Free Zones (AFZs)[217] and taken part in Pubwatch[218], a community based crime prevention scheme to foster communication between licensees of hotels and police (CoSC, 2006b). Likewise The City and the police have partnered in an Accord with Licensed Premises[219], which aims to "reduce alcohol related crime and anti-social behaviour in and around licensed premises and to improve the perception of safety" (CoSC, 2006b). The City also realises street drinkers congregating in parts of Sydney are intimidating for members of the public, and tries to discourage public drinking accordingly (CoSC, 2006c).[220] The research results confirm The City and the police are prudent in their targeting of alcohol related issues, however the results also indicate that fear of crime is high despite these efforts. Consequently, more work might need to be done to reduce this fear trigger.

The results strongly indicate that the perceived presence of gangs[221] in Kings Cross also triggered large numbers of people to feel afraid of being robbed, beaten or attacked and adopt avoidance behaviour. This avoidance reaction was somewhat unanticipated because neither The City nor the police appear to have publicly recognised gang activity

---

[216] Research in Sydney shows a significant link between the number and density of late and 24 hour trading licensed premises and alcohol-related crime (Briscoe & Donnelly, 2001).
[217] AFZs are designated in areas that commonly situate people behaving irresponsibly due to the consumption of alcohol. This behaviour involves disorderly behaviour or more serious offences under the Summary Offences Act or the Crimes Act (CoSC, 2006c). AFZ's are enforced by police and council officers (CoSC, 2006c).
[218] Pubwatch provides a forum for the discussion and solution of problems relating to violence and other criminal conduct in licensed premises (CoSC, 2006f). Police state that Pubwatch is an effective strategy for decreasing violent offences in pubs (CoSC, 2006f).
[219] Licensing Accords commenced in 1999 as part of the Safe City Strategy (CoSC, 2006f). Licensing Accords are local voluntary agreements between licensed venues, industry associations, other community stakeholders, NSW Police, and local and state government. They complement legislation relating to responsible service of alcohol (CoSC, 2006a). Licensing Accords are reportedly "effective in enhancing community perceptions of safety" (CoSC, 2006a).
[220] These areas include Foley Street and Talbot Place. The City generally deals with public drinking as a social, rather than a law enforcement, issue (CoSC, 2006e). For example, acknowledging that many of the street drinkers are homeless people, The City attempts to address the causes of homelessness and alcohol dependency issues (CoSC, 2006e).
[221] Gangs triggered fear of crime in 57% (day) and 56% (night) of the avoiding respondents.

as a current problem in the Kings Cross area. While The City and police do accept gangs as an environmental cue signifying the threat of criminal victimisation, they chiefly act to deal with gang related problems in other parts of Sydney. In contrast, a review of Australian newspaper articles printed in the last three years shows that information regarding gang related crime in Kings Cross is occasionally published.[222] The research results suggest that in order to reduce public fear of crime, action is needed to address gangs in Kings Cross. Nevertheless, as gangs are not considered part of the current Kings Cross environment, a deeper look at public perception of gangs may be necessary.

11.5.1.2. The perceived presence of gangs: Exploring the maps

As just identified, gangs were one of the top three environmental cues triggering fear of crime in terms of total number of survey respondents adopting avoidance behaviours. The avoidance maps illustrate gangs triggered the respondents to avoid large areas of the study site, and therefore avoidance was high overall (see Figure 89). Drawing on the literature on rationality referred to in section 2.3 of the literature review, this finding suggests that fear of crime experienced by these respondents is irrational given the current objective levels of risk from gang related crime. Some researchers might prematurely come to this conclusion without considering the historical and situational context of the area. This signal crimes perspective, in section 2.2.4.3 of the literature review, suggests that these are important components influencing public fear of crime.

Kings Cross does have a history of gangs and gang related organised crime, knowledge of which assists in our understanding of the high levels of fear. For example the Razor Gang wars, which occurred over the control of prostitution, 'sly grog' and cocaine, were prominent in Kings Cross between the 1920s and 1930s and to a lesser extent until the 1960s (SESIAHS, 2005).[223] 'Bikie' gangs, linked to the illicit drug

[222] See: Braithwaite, 23/8/2007; Braithwaite & Baker, 11/8/2007; Cummings, 17/6/2007; Welch, 2006; Wilson, 2007).
[223] The Razor Gangs' Kellett Street riot of 1929, reportedly one of Sydney's most vicious riots, is now acknowledged in The City's pavement signage on the corner of Kellett Street and Bayswater Road (SESIAHS, 2005).

trade, have further been associated with Kings Cross from the 1950s.[224] Kings Cross has more recently seen instances of gang related organised drug crime in the 1980s and 1990s (Wood, 1997).[225] This history could account for the respondents' fear of crime due to gangs at the time of interviewing. This implies that public fear of crime could be based predominately on past events and possibly an outdated reputation of the area as 'gangland'. In this case public perception, rather than the reality of actual gangs, would be responsible for fear and avoidance and could be targeted in fear reduction strategies. This may have implication for previous research, for example after finding that fear of crime in Glasgow was not reduced following street lighting enhancements, Nair, Ditton and Phillips (1993) concluded that fear of crime is an intractable and resistant problem. An historical assessment of the area and the effect of past experiences or levels of disorder on current levels of fear and avoidance behaviours may have assisted their study.

Comparing the research results with ideas about the presence of gangs can lead to further observations about public fear of crime. For instance, the results indicate it may not be the frequency with which the public see or hear about gangs but rather, drawing on the signal crimes perspective, the denotative meaning, connotative meaning and signal value of gang related crime. The fact that avoidance due to the presence of gangs was high and quite generalised in Kings Cross suggests gangs are an environmental cue with a high signal value, probably because the crimes they denote are severe. Gang related crimes are often conceptualised as being violent, like the incidents of assault that have occurred in Kings Cross (referenced in section 4.5). As mentioned in the literature review chapter, violent crimes are perceived as serious in nature, connote increased risk and elicit greater fear (Clark, 2003). This may also account for Katz, Webb and Armstrong's (2003) finding that fear of gangs in Arizona was equally high for residents of high and low-gang areas and not simply a consequence of objective threat or prior

[224] The history of such motorcycle groups and their prominent members is acknowledged on a tree plaque in Kings Cross.

[225] Various newspaper articles published after the interviewing for this study also indicate that gang related crime still occurs in Kings Cross. For example, there was the fatal gang shooting of a member of the Bandidos Motorcycle Club in Chapel Street during April 2006 and the shooting of a Kings Cross club bouncer by a Hells Angel bikie member in February 2006 (Braithwaite & Baker, 11/8/2007; Cummings, 17/6/2007; Welch, 2006, Wilson, 2007). Referring to a police crackdown on bikies through Operation Ranmore, the Gangs Squad Commander Scott Whyte reported that "by week three [of the operation] there was no evidence of bikies … in Kings Cross. That's something that hasn't been seen for many years" (Braithwaite, 23/8/2007).

experiences of victimisation. Katz, Webb and Armstrong (2003) explain this finding by insinuating that residents of high-gang areas do not have increased levels of fear because they recognise that gangs are more likely to victimise other gang members rather than themselves. However, this explanation does not account for the high levels of fear experienced by residents of low-gang areas, which may be a result of the possible high signal value of gangs and gang-related crime.

Furthermore, as the avoidance maps indicate, there is a strong behavioural effect resulting from this environmental cue. This is consistent with Lane and Meeker's (2000) findings from their qualitative survey based in California, which found that respondents reported that they modified their behaviour when entering gangland during the day and completely avoided certain streets at night to keep away from gangs. Despite the increase in avoidance during the night that was documented by Lane and Meeker (2000), it is interesting to note that the difference in avoidance levels during the day and night on the gangs avoidance maps is comparatively less than that for most of the other environmental cues. This suggests the temporal component to people's fear of crime due to the presence of gangs is not very prominent, which could indicate the respondents think gang related victimisation is equally as likely during the day as the night. Alternatively, the findings could suggest that the people's fear of being a victim of serious gang related crime is severe enough to warrant avoidance during the day too. These results reflect the premise that gang culture is based on and contributes to public fear and intimidation (Lane & Meeker, 2003).

Skogan (1990) indicates that gangs can be perceived as ranging from casual groups of loitering youths, to more threatening groups engaging in public drinking, drug use or harassment of passers-by, and to real organised 'fighting squads'. Interpretation of the research results could be assisted by further investigations into public perception of gangs and determining whether the public conceive gangs in Kings Cross as only representing members of organised criminal groups or also as groups of people loitering in a localised area. If the latter is true, the high levels of fear and avoidance are understandable considering the reputation Kings Cross has as a 'hang out' for groups of threatening people who may appear to be gang members. For example, a restaurant owner in Kellett Way has reported that gangs of young men harass pedestrians in the area (NSW Legislative Assembly Hansard, 2001). Occasional media exposure of

criminal incidents occurring in Kings Cross, for example the gang rape of a lady in 1979, may also contribute to the fear of crime triggered by gangs and the consequent avoidance reaction. However despite this, these severe criminal incidents are not necessarily a frequent or ongoing occurrence.

Exploring the avoidance maps more specifically, the gangs maps reveal some areas of increased avoidance, despite high avoidance all over the study site. During the day and the night, avoidance is heightened over Earl Place, Kellett Street, Kellett Way and Roslyn Gardens near Kellett Way. A broad area of Woolloomooloo also triggers fear during the day and especially during night. As there is limited literature discussing the current existence and whereabouts of gangs in Kings Cross it is difficult to compare these results with the actual presence of gangs. Regardless, the avoidance maps could potentially alert officials to gang related activity in these fear hotspots. Or should no gang activity be evident, provide some noteworthy insights into public perceptions of gangs and the fear of crime they trigger.

11.5.1.3. The perceived presence of drug users: Exploring the maps

Drug users were the top environmental cue triggering fear of crime, in terms of total number of survey respondents adopting avoidance behaviours. For this reason they are selected for 3D mapping, including an exploration of areas avoided by different socio-demographic groups. The avoidance maps for all respondents illustrate that they avoided large areas of the study site because of drug users, and therefore avoidance is high over the entire study site (see Figure 84). The fact that avoidance is high and fairly generalised mirrors hypotheses made by other researchers who imply drug users are connected with crime and therefore create fear of crime (Skogan, 1990). This also lends support for the signal crimes and disorder/incivilities hypotheses. For example, crime is frequently considered a means of financing drug use and drug users might appear threatening and unpredictable, therefore triggering fear of crime (Tulloch *et al*., 1998a, 1998b). In addition, drug users may not even be construed as rational criminals because they do "crazy things that are unnecessary and violent" (Skogan, 1990). What is more, an amplification effect could cause drug users to trigger high levels of fear and avoidance. With the amplification effect, there is a cumulative impact of numerous

weak related signals in close proximity with one another. In regards to drug users, these weak signals could be signs of drug use like syringes or people offering drugs.

Meanwhile, the avoidance mapping also introduces some more enlightening and useful information about public fear of crime in Kings Cross. Despite the fact that some people avoid large areas, others were spatially sensitive, identifying specific areas where drug users triggered their fear of crime. These fear hotspots reflect the three peaks displayed in the overall avoidance maps, which is not surprising, considering that drug users are the primary cue triggering fear of crime. However, what is noteworthy for strategies aimed at combating fear of crime, is an assessment of these areas of fear in terms of actual presence of drug users or dealers.

In relation to drug users, avoidance in the study site was highest in Peak C, which reached its top over and adjacent to the Medically Supervised Injecting Centre (MSIC). These results indicate the public could be avoiding the area because of an awareness of the existence of the MSIC and a perception or knowledge that drug users frequent its surrounds.[226] Avoidance near the MSIC is greatest at its front entrance on Darlinghurst Road and above all, at its rear exit on Kellett Street. This further reflects a conjecture that the public are attentive to the presence of drug users, especially those who are about to use drugs, or may have recently used and are intoxicated upon leaving the MSIC. With such high fear levels, the need for planning could be recommended to offset this fear and avoidance. A response could take the form of boosting the social infrastructure available to the drug users, for example expanding and improving the recovery area in the MSIC so that the users do not have to loiter in the public streets when they are intoxicated.

In contrast, these results could be interpreted as supporting the closure or displacement of the MSIC. However, even as avoidance is high around the MSIC the results do not justify this. This is essentially because avoidance is relatively low along Darlinghurst Road, making it a more suitable location for the MSIC, in terms of public fear of crime, than other more heavily avoided areas that may be more vulnerable to

[226] However, this statement cannot be confirmed without knowing how high the avoidance levels in the vicinity were before the development of the MSIC. It is assumed avoidance has increased following the establishment of the MSIC.

disorder and decline.[227] Furthermore while at the outset the high levels of avoidance because of drug users may seem like a sizeable social problem for Kellett Street and Kellett Way, it is important to consider the precise environment in question. This area comprises primarily of small lanes, on which various retail outlets and licensed premises back onto. There are no shopfronts or residences situated in Kellett Street and Kellett Way.[228] The position of the streets also mean they are not particularly suitable pedestrian avenues. Given this, it is difficult to conclude the avoidance level in this street block is a significant problem for the community. Thus as there is a need for the MSIC in Kings Cross, its present site appears appropriate with regards to fear of crime.

Nevertheless, the mapping results confirm councils should consider the behavioural public reaction arising from the presence of drug users when planning MSIC locations. Incidentally, the avoidance mapping method developed in this study would provide a useful measure for documenting levels of avoidance before and after the establishment of other MSICs in other regions.[229] Additionally, referring back to fear of crime along Darlinghurst Road, The City should note that half of the respondents who avoid Darlinghurst Road, do so because the presence of *drug users* trigger their fear. This result also reflects the reality of a large number of drug users in the immediate locality. For example, a 1999 study revealed 90% of ambulance overdose call outs occurred with a 300m radius of Darlinghurst Rod (Van Beek, 2004). This points towards the recommendation for improved social infrastructure to help reduce the number of drug users in the area, such as increased facilities to help users overcome their drug addiction and more robust policing of the drug trade.

The mapping also revealed Peak A, especially over Sydney Place, as a fear hotspot because of the presence of drug users. Sydney Place was identified as a fear hotspot in a preliminary study comparing areas of fear with sites of recorded crime. A mismatch

[227] Despite the presence of multiple signs of disorder along Darlinghurst Road, including drug users, the respondents did not avoid it as much as the surrounding areas. The avoidance maps suggest other areas do not have such factors that attract pedestrians or discourage avoidance, and they are therefore more vulnerable to avoidance, disorder and decline than Darlinghurst Road. For instance if the MSIC was relocated to the heavily avoided areas of Peak A, then it is likely even more people will avoid Woolloomooloo, thereby making it more at risk of disorder and decline.

[228] However, a restaurant owner in Kellett way has seen a proliferation of drug dealers in the past five years and is concerned by this (NSW Legislative Assembly Hansard, 2001).

[229] In reference to an existing measurement method used to record the impact of MSICs, which is the logging of the number of loitering people around the vicinity, avoidance mapping would be very suitable and beneficial (Freeman *et al*., 2005)).

over this area alerted the police to, and substantiated, intelligence that drug dealing was regularly occurring in the area. This displays the value of the avoidance mapping method as a police tool. The fact that drug users triggered fear of crime in this area should be addressed. This is largely because of the location of Plunkett Street Public School, situated next to Sydney Place, and the subsequent problems arising from dealing that could impact on school children. Drug-related crime should additionally be addressed because community members may not be accessing social infrastructure in the middle of fear hotspot, which includes a public vegetable garden, playground, BBQ setting and tennis court. However of note, drug users trigger fear and avoidance in this area predominately during the night and much less so during the day when these facilities would be in use and school children about. As discussed earlier, The City plans to redevelop this area, which the avoidance maps confirm is constructive. In doing so, The City should be vigilant not to create alcoves or hiding spaces that may encourage drug dealers or users to continue operating in the area.

The avoidance mapping further identified the presence of drug users caused people to avoid Peak B, specifically Earl Place and Springfield Mall. It is acknowledged that the street based drug scene in Australia is focused in Springfield Mall and Plaza, where drug supply and use is concentrated (CoSC 2005e; NSW Legislative Assembly Hansard, 2001; Van Beek, 2004). Likewise, The City has already acknowledged the ongoing incidence of anti-social behaviour in this vicinity and is already taking action to discourage loitering and improve the public amenity, something these results confirm is necessary to help reduce fear of crime (CoSC, 2005f). As the Village Centre and a hub for retail activity, pedestrian attendance in Springfield Mall is particularly important to the vitality of Kings Cross. Therefore, the social programs mentioned in section 11.4.2.2, which are designed to 'activate the street life' and could potentially deter the occurrence of drug dealers or users, are recommended.

Also of note is the apparent lack of a relationship between fear of crime and the location of syringe bins for drug users. In some areas fear of crime reflects the location of syringe bins and in others it does not. The maps show that there are some syringe bins located in high fear areas.[230] In particular is the bin located at the Darlinghurst

[230] These syringe bins are located in: Hourigan Lane; Daffodil Park between Brougham and McElhone Streets; Kings Cross Library toilets; and at the Darlinghurst Road and Victoria Street

Road and Victoria Street intersection south of William Street. Fear of crime is very low south of William Street and peaks slightly at this intersection, which makes it appear fear of crime could be related to the presence of this syringe bin and drug users making use of it. The previous paragraphs have explained why fear of crime is high in Peaks A, B and C, where there are no syringe bins. However, there are also locations with syringe bins and low fear of crime.[231] This could be brought about by a number of reasons. Firstly, it could mean that the respondents did not go to those locations for reasons other than fear of crime. It could also be that the respondents were not aware of the location of the syringe bins or the presence of drug users near them. In contrast, the respondents may have been aware of the syringe bins and drug users yet did not find their presence threatening in those locations. If this were the case, it could suggest that people react differently to signs of disorder, for example drug users, when there is evidence that the disorder is being monitored and managed, like through the establishment of syringe bins. This may have implications for policy and planning and therefore looking at the secondary effects of disorder management on fear of crime may be an area worthy of future research. Lastly, the low levels of fear around certain syringe bin could mean that drug users do not operate near these bins. This last possibility has also implications for The City, and it may be worthwhile that the bins are assessed in terms of the appropriateness of their location.

Another dissonance between the avoidance maps and the actual location of drug-related crime occurs in Roslyn Street. Avoidance is low along Roslyn Street despite previous reports that drug dealers regularly congregated there (NSW Legislative Assembly Hansard, 2001). However, Roslyn Street is considered to be a major venue for cannabis, rather than heroin, dealing (Darcy, pers com, 17/3/04). Therefore this dissonance is not surprising considering the fact that the respondents were asked whether the presence of *junkies*[232], rather than drug users in general, triggered their fear of being robbed, beaten or attacked. Nevertheless, this uncovers an opening for

---

intersection south of William Street. There are also several syringe bins in areas where fear of crime is neither particularly high or low. These sites include those at Burrahpore Lane, Walla Mulla Park, Talbot Lane; and Hordern Stairs.

[231] These syringe bins are located at the Wayside Chapel on Hughes Street (on the north cusp of Peak B), in Fitzroy Park Gardens, in Lawrence Hargrave Park (on the northeast cusp of Peak C), and at the southern side of the Forbes and William Street intersection.

[232] Section 5.1.2.2.c, states that *junkies* are known as intravenous drug users, users of other illicit drugs and drug dealers (Darcy, pers.com 12/3/04).

research focussing on how different types of drugs and drug-related activity differentially affect fear of crime and avoidance.

Some additional avenues for further research have come about from analysing the *drug users* avoidance map. By breaking down the *drug users* category into sub-groups more information on public fear of crime can be obtained. For example delineating drug users as either drug dealers, known drug users or people who look like drug users, could potentially provide some more useful results in regards to policy and planning. The police could target areas where drug dealers are perceived to operate. Areas where drug users are located, when they do not spatially coincide with drug dealers, could be improved through the provision of better social infrastructure. Furthermore drawing on the signal crimes perspective, future survey questions could be more qualitative when asking respondents how drug users trigger their fear of crime. This might include asking if the drug users must be outwardly verbally or physically threatening to trigger fear or if drug users trigger fear even when they appear quiet and unobtrusive.

11.5.1.3.a. Avoidance triggered by drug users according to the residential status of the respondents

The spatial visualisation of areas avoided due to the perceived presence of drug users also allows for some more enlightening results when different maps are produced for the different socio-demographic groups. For example despite the similarity that few residents and visitors avoid the study site south of William Street, in north of William Street there are noticeable differences between the fear of crime triggered by drug users for residents and visitors (see Figure 87 and Figure 88). Visitors to Kings Cross account for a majority of those respondents who indicated the presence of drug users triggered their fear of crime.

During the day, the visitors avoid a much larger area than the residents, and are more spatially general in their avoidance patterns. Avoidance for the visitors is only slightly higher in Peak C and at the southern edge of Peak B, than in the remaining area north of William Street. In contrast, the residents are more localised in their avoidance. For example, the steep slope of the land around Peak C illustrates that the residents identified the MSIC and avoided a specific area around it during the day and night.

Avoidance is even visibly heightened for the residents in Kellett Street and Kellett Way. Increased avoidance for the residents is also clear over Sydney Place in Peak A, over Walla Mulla Park (where two syringe bins are located), and over Butler Stairs. Increased avoidance over these sites indicates an intimate knowledge of the presence of drug users. Moreover, during the day the residents avoided Darlinghurst Road nearly as much as they did the neighbouring street blocks, whereas the visitors did not avoid this street. This further points towards a residential awareness of drug users on Darlinghurst Road and suggests that during the day residents may be traversing through and patronising areas other than their own neighbourhood centre.

However, conversely, during the night the residents have comparatively higher fear of crime than they do in the day, and are also quite general in their avoidance. Nevertheless, the avoidance map for the residents does show avoidance is still very sharp over the MSIC and along Earl Place. This is also indicated on the visitors map, although not to the same degree. As for the visitors, the residents also perceive Darlinghurst Road as a safe thoroughfare during the night. With drug users triggering fear of crime much more during the night for both the residents and visitors, these results reflect the perceived changing nature of the social environment and the effect it has on people's behaviour.

Overall these results suggest that residents' fear of crime is more consistent with the reality of risk of victimisation than visitors' fear of crime. This is likely because residents are familiar with their environment, as inferred in other studies (see Ferraro & LaGrange, 2000; Gray & O'Connor, 1990; Gilchrist *et al*., 1998). The results support the proposal that knowledge of actual crime rates, or in this case the presence of drug users, can affect perceptions of risk. Knowledge also plays a role in reducing fear of crime (Garofalo, 1981). It consequently strengthens the argument that community involvement in combating crime and the dissemination of crime prevention information through newsletters and meetings could be effective in further reducing fear of crime, as indicated in the section 2.3.3 of the literature review chapter. Similarly, the results also mirror studies that propose residents with a strong sense of place attachment to their home and neighbourhood perceive fewer incivilities and have lower fear of crime

(Brown *et al*., 2003).[233] The results additionally insinuate that visitors, who may be less familiar with the environment, are likely to avoid a larger area than is perhaps warranted by the risk of victimisation in order to reduce their fear levels. If this is the case, it is difficult to judge whether something should be done to change the extent of this method of risk minimisation. However, the results could also mean that visitors' fear of crime, and consequently patterns of avoidance, are based more on the reputation of the area rather than on the actual presence of drug users. In this situation, improving the reputation of Kings Cross could help reduce fear of crime in the region.

11.5.1.3.b. Avoidance triggered by drug users according to the sex of the respondents

The respondents who indicated that drug users triggered their fear of crime, were also separated by sex. The information obtained provides another example of the value of avoidance mapping. On the whole, more female respondents than male respondents adopted avoidance behaviour because of the presence of drug users (see Figure 85 and Figure 86). However, while men's fear of crime is comparatively lower than women's, a large proportion of the male respondents nonetheless felt afraid of crime due to the presence of drug users. Accordingly, they also adopted avoidance behaviours. Therefore, while this supports a general consensus that women's fear of crime is higher than men's, it contradicts usual statistical reports that men's fear is low (Gilchrist *et al*., 1998; Smith, 1987).

During the day, avoidance patterns adopted by the male and female respondents are varied. The female respondents are quite spatially general in their avoidance patterns, with Peaks A, B and C only slightly noticeable. This is different from the avoidance adopted by the male respondents during the day. The males clearly avoid Earl Place and Springfield Mall in Peak B and Kellett Street and Kellett Way in Peak C, more so than the remainder of the study site. Like the females, the males also avoid a fairly large area of Peak A. This is the only other apparent fear spot on the males avoidance map. However on the females avoidance map, the entry to Kings Cross railway station

[233] Those residents who have strong place attachments are often those who have resided in the neighbourhood through times of decline and high residential turnover, are older and own their own home (Brown *et al*., 2003).

on Victoria Street is also evident as a fear hotspot. An additional interesting result from this avoidance map is that like Darlinghurst Road, Fitzroy Gardens seems to be considered a distinctly safe area. This could reflect propositions that signs of 'naturalness' and vegetation, for women at least, help to create a sense of safety and reduce fear of crime (Kuo & Sullivan, 2001; Nasar, 1998).

Is not surprising that fear of crime during the day was higher for the female than the male respondents. As mentioned previously, fear triggered by drug users could arise because they are often regarded as being threatening, unpredictable and likely to attack and rob passers-by. Accounting for women's increased fear of crime is a number of proposed physical vulnerabilities. These are that women may believe that they do not have the physical strength or self-defense skills necessary to resist or flee such an attack by a drug-user (Garofalo, 1981; Gilchrist *et al*., 1998; Gray & O'Connor, 1990; Riger *et al*., 1978; Smith & Torstensson, 1997; Toseland, 1982; Will & McGrath, 1995). Consequently, women may also consider themselves a more attractive target than men and feel additionally fearful (Gilchrist *et al*., 1998). Furthermore, women may feel like they are more likely to be injured than their male counterparts during victimisation (Garofalo, 1981; Hindeland *et al*., 1978; Riger *et al*., 1978; Smith & Torstensson, 1997; in Smith & Hill, 1991). In contrast, men are socialized to believe they can physically resist and recover from an attack and therefore could have lower levels of fear than women (Gilchrist *et al*., 1998; Smith & Torstensson, 1997).

Despite these daytime differences in avoidance, during the night the avoidance patterns adopted by the male and female respondents are more similar. During the night, the avoidance map for the female respondents is very similar to their corresponding map during the day, however with increased avoidance density. Of note is the fact that increased avoidance over Butler stairs is visible and that Victoria Road the entire study site south of William Street are heavily avoided. For the male respondents, avoidance also increases and peaks in the same high fear spots as those evident on the day map. However, overall avoidance levels are also very high and the maps illustrate that during the night the male and female respondents collectively avoid similar areas. It is clear from the night maps that fear triggered by drug users is not solely a women's problem. The spatiality of men's fear, and patterns of avoidance, are not overly different from women's.

11.5.2. The environmental cues that triggered an intermediate level of fear of crime

Laneways, rubbish/syringes, areas to hide, loitering people, blocked escape, poor street lighting and pedestrian absence triggered and intermediate level of fear of being robbed, beaten or attacked. Areas to hide were selected for 3D mapping and are discussed in more detail following this preface.

11.5.2.1. Seven middle ranked environmental cues

Laneways[234] were top of the middle ranked environmental cues that triggered fear of crime in the respondents.[235] The City maintains that the management of laneways is considered in development plans and policies, for example in the 'City of Sydney Policy for the Management of Laneways in Central Sydney'[236] (CoSC, 1999). However, only one of the laneways located in the Kings Cross study site, McElhone Stairs, is discussed in this policy. In reference to McElhone Stairs, the policy reports that the steps are to be retained with enhanced pedestrian activity. While not particularly detailed, the policy provides a promising starting point for the further considerations of the effect laneways have on public fear of crime, and the planning of appropriate development. The survey results suggest the council plans discussed in the previous section, could also feature more attention on laneways.

Rubbish/syringes[237] ranked quite high as an environmental cue that triggered the respondents to feel afraid of crime.[238] The City addresses rubbish/syringes in various policy papers, stating they are committed to maintaining public spaces as safe and clean for the whole community (CoSC, 2006g). In particular, the City of Sydney's 'Syringe Management Plan 2005-2010' documents key strategies designed to reduce the number

[234] Laneways triggered fear of crime in 45% (day) and 50% (night) of the avoiding respondents.
[235] According to Darcy's (2005) study in 2003, *laneways* were ranked as the equal least common reason for making the public feel unsafe. *Dark laneways* were ranked as the equal fourth most common reason for making the public feel unsafe.
[236] Generally, this policy states that laneways will be improved with appropriate lighting (CoS, 1999). This plan may help reduce the extent to which laneways trigger public fear of crime.
[237] Rubbish/syringes triggered fear of crime in 44% (day) and 48% (night) of the avoiding respondents.
[238] According to Darcy's (2005) study in 2003, lack of cleanliness was ranked as the equal second least common reason for making the public feel unsafe.

of syringes inappropriately discarded by drug users in public spaces (CoSC, 2005b; CoSC, 2006g).[239] One of these strategies involves the placement of 62 community sharps bins throughout the Sydney LGA, many of which are located in the Kings Cross study site (CoSC, 2006g). While these plans imply that The City is on the right track by targeting rubbish/syringes, the results show the presence of these items still trigger public fear of crime and avoidance, and therefore it appears more action is warranted. The East Sydney Neighbourhood Association (ESNA) also supports these sentiments (ESNA, 2002). This action could possibly take the form of ongoing monitoring programs with prompt rubbish/syringe removal.

Areas to hide[240] are placed towards the top of the middle group of environmental cues that trigger people's fear of being robbed, beaten or attacked. A review of council plans and policies found little reference to addressing areas within public spaces that can be used as hiding or entrapment places. One recommendation was found in the 'South Sydney Plan 1997', in which The City refers to Green Square town centre and states that external lighting needs to make potential hiding spots visible. The research results suggest that the council also needs to consider how areas to hide trigger fear of crime in Kings Cross. The areas to hide avoidance maps are discussed in more detail in the next section.

The presence of loitering people[241] is placed in the middle group of environmental cues that trigger people to feel afraid of crime.[242] While The City does not address loitering people as a stand-alone issue, it identifies loitering people as a problem in Kings Cross and targets them through various policies. For example, because loitering people can cause 'disturbance', The City has disallowed people loitering outside sex industry premises through the 'City of South Sydney Sex Industry Policy 2000'. The presence of loitering people is also restricted through planning, as The City requires that loitering people be addressed by businesses in development applications. For instance,

---

[239] This Plan also demonstrates The City's "commitment to public health, harm reduction and the improvement of safety and cleanliness of the public domain for the entire community - residents, visitors and workers alike" (CoS, 2006g).
[240] Areas to hide triggered fear of crime in 39% (day) and 43% (night) of the avoiding respondents.
[241] Loitering people triggered fear of crime in 43% (day) and 46% (night) of the avoiding respondents.
[242] According to Darcy's (2005) study in 2003, loitering people were ranked as the equal least common reason for making the public feel unsafe.

The City stipulates that the licensee and staff of a proposed licensed hotel in Potts Point "take all reasonable steps to ensure that there is no loitering by persons seeking admittance to the premises" (Meeting Minutes 08/05/06).[243] Other approaches focussing on loitering, for example that occurring in Springfield Plaza, involves the occurrence of concerts as "part of an overall program to activate the space in a very positive way" (Lord Mayor, Meeting Minutes 05/12/05). The results suggest these actions may also be sensible for addressing fear of crime.

Blocked escape[244] was also placed in the middle group of environmental cues that triggered people to feel afraid of crime in Kings Cross. In the 'South Sydney Plan 1997', The City recommends that building designs, particularly entry points, minimise the presence of entrapment spots (another term for blocked escape). In reference to one city area, Green Square Town Centre, The City also states that entrances to public open space should encourage pedestrian use and also provide visual security through the establishment of clear sightlines (CoSS, 1997a). The public domain is to be designed to ensure there are no dead ends or similar. In regards to fear of crime, the research results indicate blocked escape can adequately be addressed through such plans.

During the night, poor street lighting[245] ranked towards the top of the middle ranked environmental cues that triggered fear of crime in the respondents, and towards the bottom of this category during the day.[246] Street lighting in its various forms is a central consideration of The City in 'The City of Sydney Exterior Lighting Strategy' (CoSC, 2000). The first objective of this strategy is "to improve the illumination of the City of Sydney at night to ensure public safety, public enjoyment, architectural appreciation, and night-time entertainment". Additional aims are to illuminate public and pedestrian areas "to a standard that provides a safe and comfortable visual environment", and "to a level that will reduce the risk of crime to people and property"

[243] Similarly, The City also demanded that another application be approved for Kings Cross if the management or licensee of the premises is responsible for ensuring loitering patrons do not detrimentally affect the amenity of the neighbourhood (Meeting Minutes 05/12/05). The management was also held responsible for "the control of noise, loitering and litter generated by patrons of the premises and shall ensure that people leave the premises and area in an orderly manner" (Meeting Minutes 05/12/05).
[244] Blocked escape triggered fear of crime in 35% (day) and 36% (night) of the avoiding respondents.
[245] Poor street lighting triggered fear of crime in 36% (day) and 52% (night) of the avoiding respondents.
[246] According to Darcy's (2005) study in 2003, *lighting* was ranked as the equal second least common reason for making the public feel unsafe.

(CoSC, 2000). This strategy works in conjunction with the 'Safe City Strategy', part of which focuses on lighting for pedestrian safety (CoSC, 2000). The results of this study support the actions undertaken by the City in addressing *poor street lighting* through these strategies. However, the results emphasise the need for particular attention to be paid to street lighting in Kings Cross, if fear of crime is to be addressed.[247]

Pedestrian absence[248] was at the bottom of the middle ranked environmental cues that triggered people to feel afraid of crime. An assessment of many City of Sydney plans and policies indicates that most of The City objectives are either directly or indirectly aimed at encouraging pedestrian use of and activity in public spaces. Therefore it is difficult to suggest more plans or policies be put in place to address this environmental cue. However, by perhaps increasing the amount of safe cues in the environment, the City could potentially reduce people's fear of crime when other pedestrians are absent. Also closely aligned with pedestrian absence is the lack of natural surveillance. Natural surveillance is something The City does specifically promote. For instance in the South Sydney Plan 1997, The City recommends buildings are orientated towards the street so as to maximise surveillance.[249]

11.5.2.2. The perceived presence of areas to hide: Exploring the maps

The avoidance patterns, adopted by respondents who indicated areas to hide triggered their fear of crime, were extremely general during the day (see Figure 90). As in the other avoidance maps, avoidance is comparatively low south of William Street and along Darlinghurst Road and Macleay Street. However, unlike in the other avoidance maps, minimal differentiation was made between Peaks A, B and C and the remainder of the study site north of William Street. With surprising little spatial variance of avoidance during the day, it is difficult to see how an analysis of this

[247] The fact that poor street lighting also triggered a fear of crime response during the day could suggest this issue is a very salient issue in the minds of the respondents, that some streets like small laneways need street lighting during the day, or that there were problems with the survey interviewing procedure.
[248] Pedestrian absence triggered fear of crime in 33% (day) and 37% (night) of the avoiding respondents.
[249] The City aims "to ensure development is designed to minimise opportunities for criminal and anti-social behaviour and maximise natural surveillance so that people feel safe at all times of the day and night" (CoSS, 1997).

avoidance map can affect policy and planning. This is disappointing given that the fear mapping studies conducted by Fisher, Naser and Grannis (1993), Fisher and Naser (1995) and Nasar and Jones (1997) found specific areas with low prospect, high concealment and blocked escape, which included areas to hide, were significantly associated with increase levels of fear of crime. Fisher and Naser (1995) propose that potential victims may feel greater exposure to risk and loss of control over their immediate environment in these areas and therefore experience heightened fear of crime. While this may be true, the results from the current study could suggest that the levels of fear of crime triggered by areas to hide in Kings Cross may not warrant microlevel changes in avoidance.

More spatial variance was evident on the areas to hide avoidance map for the night than the day. The night avoidance map shows avoidance is highest along the streets in Peak C and Peak B, and to a lesser extent in Woolloomooloo generally. The map also shows that, unlike during the day, avoidance is high along Victoria Street during the night. Nevertheless with no known reports or studies investigating the whereabouts of areas to hide in Kings Cross, it is difficult to compare these fear hotspots with the existence of areas to hide in reality. An assessment of the areas may or may not reveal that the respondents' perceptions reflect the physical environment. If their perceptions reflect the physical environment, the avoidance mapping will have been useful for identifying areas where development should focus on the removal of hiding and entrapment spots. If not, this could indicate the respondents do not successfully visualise the areas they avoid when considering this environmental cue. It could also indicate that the thought of areas to hide affects public fear and avoidance behaviours even when areas to hide are not present in reality.

11.5.3. The environmental cues that triggered the least fear of crime

Rundown/abandoned buildings, homeless people, vandalism, offensive/degraded shops, spruikers and sex workers triggered the least fear of being robbed, beaten or attacked. Sex workers were selected for 3D mapping and are discussed in detail following this preface.

11.5.3.1. Six lower ranked environmental cues

Of the lower ranked environmental cues, rundown/abandoned buildings[250] triggered the most fear of crime in the respondents. The City realises that vacant building sites and buildings have a negative effect on "the quality of the public domain, and on businesses and residents surrounding these sites" (CoSC, 2001). In the 'Central Sydney Development Control Plan 1996'[251], The City aims to improve the appearance of such sites and, where practicable, ensure that on-going temporary active uses or landscaping at the street frontage is provided.[252] While rundown/abandoned buildings were ranked reasonably low, the results from this research indicate that The City could do more in ensuring these objectives are met, and thereby reducing fear of crime.

The presence of homeless people[253] was also ranked in the lower group of environmental cues that trigger people to feel afraid of crime.[254] The City of Sydney provides three major services to homeless people. These are the Homeless Persons Information Centre, the Homelessness Brokerage Program and the City Street Outreach Service (CoSC, 2006e). These social services are not directed at reducing fear of crime, but rather assisting homeless people to find accommodation and live independently. However, it is possible that a reduction in fear of crime is an unexpected benefit, as suggested in section 2.3.3.3 of the literature review. The results of this research do not indicate that any additional strategies focussing on fear of crime in relation to homeless people need to be implemented.

Vandalism[255] also ranked in the lower group of environmental cues that trigger people's fear of crime. Under their 'Strategic Plan 2006-2009' the City of Sydney ascertains that public assets are to be maintained as "clean, accessible, safe, aesthetic, fit

---

[250] Rundown/abandoned buildings triggered fear of crime in 25% (day) and 32% (night) of the avoiding respondents.
[251] Consolidated in 2001.
[252] The plan states "it is important that construction sites and vacant sites present an attractive appearance to the streets and public areas in order to enhance the amenity of Central Sydney" (CoSC, 2001).
[253] Homeless people triggered fear of crime in 33% (day) and 31% (night) of the avoiding respondents.
[254] As mentioned earlier *drug users/homeless* were ranked as the most common reason for making the public feel unsafe in Darcy's (2005) study in 2003. The results from this thesis suggest the *drug users/homeless* category in Darcy's study was ranked high because of the existence of *drug users* within it.
[255] Vandalism triggered fear of crime in 25% (day) and 29% (night) of the avoiding respondents.

for purpose, and meet community needs" (CoSC, 2006i). Vandalism falls under this planning strategy, with the City aiming for proactive and effective maintenance. The City states that, "high levels of community ownership of public domains, parks and facilities reduce the incidence of vandalism and through timely reporting assists in proactive maintenance of City assets" (CoSC, 2006i). In this document, little more is said on how the City plans to achieve this goal. However other policies, such as the Aerosol Art and Graffiti Resolution (CoSC, 2003) and Graffiti Management Policy (CoS, 2004b) target specific types of vandalism and are more thorough in terms of outlining strategies. Like all vandalism, graffiti is illegal[256] and the City intends to inspect graffiti hotspots every 24 hours and remove graffiti within 24 hours of identification (CoSC, 2004b).[257] For graffiti, Kings Cross is not listed as a priority area and the results from this thesis reflect this assessment.

The presence of offensive/degraded shops[258] was not a key environmental cue triggering people's fear of crime. Offensive/degraded shops can take a variety of forms. Firstly, The City recognises that the public can consider music and crowd noise from shops, particularly licensed premises, as offensive or a nuisance. With this in mind, The City puts in place noise restrictions and actively supports the investigation of noise complaints by other parties like the Department of Gaming and Racing Legal and Licensing Section (CoSC, 2006h). Secondly, The City recognises that shops advertising or displaying products associated with sexual behaviour can also be offensive. The 'City of South Sydney Sex Industry Policy 2000' refers to Section 578E of the Crimes Act 1900, in restricting the terms of selling or disposing of these products (SoSS, 2000).[259] Similarly, under the objectives of the Central Sydney Local Environment Plan 1996[260], the impact of premises which degrade the amenity of Central Sydney, such as brothels, restricted premises and late opening pubs, will be

[256] This offence is reported by the NSW Police as malicious damage. Most graffiti related offences in NSW are handled under the Summary Offences Act 1988 (CoSC, 2004b).
[257] Or within 24 hours of the property owner's consent being obtained. Priority Zones contain streets that are subjected to high pedestrian traffic and are subjected to a large amount of graffiti and posters on a daily basis (CoSC, 2004b).
[258] Offensive/degraded shops triggered fear of crime in 21% (day) and 25% (night) of the avoiding respondents.
[259] The Act documents that "any person who carries on, or who is engaged in, the business of selling or disposing of products to which this section applies must not: Advertise, or cause another person to advertise, in any manner the nature of that business, or exhibit or display any such products: (i) to a person who has not consented to or requested the exhibition or display, or (ii) in a manner so that they can be seen from outside the premises of the business by members of the public" (SoSS, 2000).
[260] Consolidated in 2005.

minimized. This involves the assurance that these premises "are not concentrated together, and that their cumulative impact is assessed" (CoSC, 2005a). The results of this research do not indicate that any additional strategies focussing on fear of crime in relation to offensive/degraded shops need to be implemented.

The presence of spruikers[261] was the second lowest ranked environmental cue triggering people's fear of crime in Kings Cross.[262] The City is officially in opposition to spruikers. Sex-industry related premises, strip clubs and other properties require development consent from The City to undertake spruiking activities (CoSC, 2006a). Approval may be subject to the applicant's devising and complying with a stringent Spruiker Management Plan[263] (CoS, 2005f). The results of this research indicate in terms of fear of crime The City's attention to the behaviour of spruikers is sufficient.

The presence of sex workers[264] was the lowest ranked environmental cue triggering the respondents' fear of being robbed, beaten or attacked.[265] The City's Adult Entertainment and Sex Industry Premises Development Control Plan 2006 controls the development and operation of sex industry premises (CoSC, 2006h). The Plan is designed to minimize any negative impacts arising from these premises (CoSC, 2006h). The results from this thesis indicate the City is doing a good job in managing the presence of sex workers in terms of their impact on peoples' fear of crime. Conversely, ESNA argues that illegal brothels, street prostitution and curb crawling are a significant problem in the area (ESNA, 2002).

---

[261] Spruikers triggered fear of crime in 22% (day) and 25% (night) of the avoiding respondents.
[262] As mentioned earlier *spruikers/intoxicated persons* were ranked as the third most common reason for making the public feel unsafe in Darcy's (2005) study in 2003. The results from this thesis suggest the *spruikers/intoxicated persons* category in Darcy's study was ranked high because of the existence of *intoxicated persons* within it.
[263] For example under their Spruiker Management Plan, Playbirds International directs spruikers not to use swearing or offensive language, spruik at a volume that other pedestrians are disturbed, act as a physical barrier to pedestrians, touch potential customers, approach disinterested persons and more (CoSC, 2005f).
[264] Sex workers triggered fear of crime in 18% (day) and 20% (night) of the avoiding respondents.
[265] According to Darcy's (2005) study in 2003, sex workers were ranked as the second most common reason for making the public feel unsafe. The contrasting result from this thesis is noteworthy, however not necessarily surprising given the different research approaches taken in the two studies.

11.5.3.2. The perceived presence of sex workers: Exploring the maps

Sex workers triggered the least fear of crime of all of the environmental cues, in terms of total number of survey respondents adopting avoidance behaviours. The avoidance maps reflect this by displaying low avoidance density during the day and night in comparison to the other 15 environmental cues (see Figure 91). The low avoidance density is expected, as sex workers are not frequently discussed in the fear of crime literature as being threatening in their own right.

During the day avoidance was very low and constant over the study site, with Peaks A, B and C barely evident. Despite still being relatively low, avoidance is slightly higher along Darlinghurst Road and in the street block that makes up Peak C, than in the remainder of the study site. As Darlinghurst Road is the primary location where daytime sex workers solicit potential clients, this result indicates fear of crime and avoidance reflects the actual presence of sex workers and commercial brothels. Similarly, the avoidance in Peak C reflects the location of a sex workers' outreach centre and the MSIC on Darlinghurst Road. It is widely acknowledged street prostitution is intimately connected with drug use and dealing, and therefore it is likely respondents could link the presence of sex workers with the MSIC (ESNA, Undated).

Avoidance in these two areas and over the remainder of the study site increases during the night. This increase is to be expected given the increase in number of sex workers operating in the afternoon and evening hours. Notably, avoidance increases around Forbes Street near William Street, and along Darlinghurst Road south of William Street. These two sites fall within another known area for sex workers, which is bounded by Bourke, William, Victoria and Burton Streets (Perkins, 1991). While avoidance was also slightly heightened south of William Street, along Victoria Street and in an area east of Darlinghurst Road, these streets are not documented as having a presence of sex workers. In converse, avoidance is not particularly noteworthy along Bourke and Liverpool Streets, where illegal street prostitution is regarded as a problem (ESNA, 2002).

However despite the low overall fear levels and slight avoidance hotspots in some areas, the avoidance maps for *sex workers* do reveal large avoided areas that are

surprisingly general. Drawing from the disorder/incivilities thesis, this could be because the presence of sex workers can be considered indicative of a breakdown in standard social norms and possibly law enforcement, and therefore may well instigate public perceptions of crime and fear of crime. In line with this, ESNA[266] states prostitution can be accompanied by heroin trafficking in the streets; the reckless disposal of syringes; large volumes of litter; the use of laneways as places for sex; open air toilets and 'shooting galleries'; the menacing presence of 'minders' who may be involved in drug dealing and 'turf wars'; the verbal and physical abuse of residents by the sex workers; the frequent accosting of female residents by clients, who assume that all females in the streets are sex workers; and the threatening behaviour and presence of young, often drunk, men who are attracted to the street as clients or voyeurs (ESNA, 2002). Following on, prostitution has also been associated with crime, for example there have been numerous rapes and assaults of street sex workers by their clients (ESNA, 2002). It is perhaps these potential accompanying factors, which may also independently signify crime, that account for the generalised fear of crime triggered by sex workers.

As mentioned in the previous section, the City's Adult Entertainment and Sex Industry Premises Development Control Plan 2006 aims to reduce any negative side effects arising from the presence of adult entertainment and sex industry premises (CoSC, 2006h).[267] For example, the Plan permits the location of sex industry premises in areas that optimise the safety and security of staff and visitors. Sex industry sites should further ensure that the premises do not have an adverse impact on the character or amenity of the area and neighbouring properties (CoSC, 2006h). However, ESNA maintains the City's Plan does not cover the large number of home business brothels that do not require development approval and do create adverse effects (ESNA, 2002). Moreover, Sections 19 and 19A of the *Summary Offences Act 1988*, declares street prostitution and curb crawling 'near or within view from a dwelling, school, church or hospital' as an offence (ESNA, 2002). ESNA similarly argues that this Act is not enforced and therefore street prostitution is left uncontrolled (ESNA, 2002). ESNA

[266] ESNA also describes multiple other dangers and nuisances arising from the presence of street sex workers (ESNA, 2002).
[267] This includes commercial brothels, local business brothels, safe house brothels for street workers, escort agencies offering sexual services, restricted premises, and sex on premises venues, bondage & discipline venues, swingers clubs and the like, but does not include private sex workers home business premises (CoSC, 2006h).

hopes for a unified effort between the community, police and government to remove prostitution from residential zones to mixed-use, commercial and industrial zones. While the results from the avoidance maps show *sex workers* are by no means a priority environmental cue that triggers fear of crime, the fact that avoidance still occurs, especially in residential zones, favours the suggestions presented by ESNA.

11.5.3.2.a. Avoidance triggered by sex workers according to the residential status of the respondents

There are very different patterns of avoidance adopted by visitors and residents in response to sex workers triggering their fear of crime (see Figure 94 and Figure 95). This is most pronounced during the day, with the residents avoiding a small area along Darlinghurst Road and the visitors avoiding a much broader area over the entire study site. The localised area avoided by the residents reflected the actual whereabouts of sex workers. This result mirrors the finding from the corresponding drug users maps that residents' fear of crime is more consistent with the reality of risk of victimisation than visitors' fear of crime. However despite this, avoidance is also greatest for the visitors along Darlinghurst Road. This indicates that although the visitors are more general in the area that they avoid because of fear of crime, they also identify Darlinghurst Road as the primary location for daytime sex workers.

The areas avoided by the residents during the night, also seem more specific than those areas avoided by the visitors. For example, residents have increased avoidance levels along Darlinghurst Road, specifically where there are strip clubs, brothels and x-rated shops. Another notable difference is that the visitors avoid Victoria Street north of William Street as much as they do the surrounding area. In comparison to the avoidance map for the residents, Victoria Street is not heavily avoided, with the exception of its intersection with Butler Stairs. Also of note is the fact that avoidance increased only for the residents around the Forbes and William Street corner and mostly for the visitors along Darlinghurst Road south of William Street.

11.5.3.2.b. Avoidance triggered by sex workers according to the sex of the respondents

Likewise, there are some very noticeable differences between the avoidance patterns adopted by the male and female respondents because sex workers trigger their fear of crime (see Figure 92 and Figure 93). Overall, the avoidance density during the day and the night was higher and more generalised for the female respondents than for the male respondents. Despite the statistics indicating women are less likely to be a victim of crime than men, especially of being robbed, beaten or attacked, this result is predictable (Hanson *et al*., 2000; Mirrlees-Black *et al*., 1998 in Nelson *et al*., 2001).

Given the point made in the previous section that sex workers are often accompanied by 'menacing' males, it is expected that sex workers would trigger fear of being robbed, beaten or attacked amongst women (ESNA, 2002). These crimes are inclusive of sexual assault, the one type of crime that women are more likely to experience than men (Hanson *et al*., 2000).[268] When thinking about sex workers, sexual acts and 'menacing' males the female respondents could become fearful of being sexually assaulted. They would therefore be inclined to adopt avoidance behaviours. In contrast, men do not generally consider themselves as likely victims of sexual assault. Their fear is lower and therefore it is expected their levels of avoidance would be lower than that of the female respondents, as was the case in this study (Hanson *et al*., 2000; Riger *et al*., 1978 in Gilchrist *et al*., 1998).

Furthermore, drawing on notions of social vulnerability, women are said to fear male dominated areas like 'red light' districts (Koskela, 1999). This is partly attributed to the idea that women can be socialised to fear strangers, men and public spaces (Gilchrist *et al*., 1998).[269] Hale (1996) similarly comments that women have been socialised to feel dependent on men and powerless in society, particularly in such male dominated areas (Katz *et al*., 2003). A number of researchers further suggest this powerlessness causes women to perceive they have less control over their personal space and the public domain (Pain, 2000; Brooks Gardner, 1990 & Pain, 1991 & Pain,

[268] Women's fear of sexual assault, particularly rape, is high because such crimes are perceived to be extremely serious and relatively likely, particularly in environments with sex workers (Braumer, 1978 in Gray & O'Connor, 1990; Warr, 1985).
[269] For further information on women's increased social vulnerabilities see: Katz *et al*., 2003; Pain, 2000; Gilchrist *et al.*, 1998; and Toseland, 1982.

1993 in Gilchrist *et al*., 1998; Toseland, 1982). These vulnerabilities consequently elicit feelings of being at greater risk of victimisation than men. Thus women have elevated levels of fear of crime. With the large number of brothels and other adult services targetting male clients, Kings Cross can be considered a male dominated area that could therefore provoke fear in women.[270] This could be particularly the case for those specific sites in which sex workers are perceived to be present. Thus these sites would trigger heightened fear of crime in the female respondents.

In addition to the differences in overall avoidance levels, the avoidance maps point out some subtle differences in the patterns of avoidance due to the presence of *sex workers*. Those few males that adopt avoidance behaviour do so mainly along Darlinghurst Road, and also along Roslyn Street during the night. For the female respondents, avoidance was also greatest along Darlinghurst Road during the day and night. However, during the night avoidance was very broad extending into much of Peaks B and particularly C. These slight differences may also reflect that the females were being more cautious than the males by avoiding much larger areas.

11.5.4. Sensitively addressing environmental cues

Despite arguing that the highly ranked environmental cues should be targeted when designing and implementing fear reduction strategies, it is recognised that there is a need for sensitivity. There are two ends of a continuum that focus on the targeting of social incivilities as a form of social control. One end is dominated by the thoughts of 'communitarians' or 'universalists' who propose the rigorous maintenance of social control and the need for all fear inducing environmental cues to be eradicated from affected communities, for the common good (Kelling & Coles, 1997). At the other end, the 'rights' activists argue that people involved in so-called disorderly behaviour are being scapegoated and inappropriately marginalised through social control (at the expense of their fundamental liberties and rights to express themselves) (Kelling & Coles, 1997; Pain, 2001).

[270] Additionally, 87.5% of the 'persons of interest' in assaults in inner Sydney are male (Briscoe & Donnelly, 2001).

The 'rights' activists argue that social control and the maintenance of public order can involve the subordination of these groups to the norm, their retribution and/or their estrangement from the community (Bauman, 2000; Hubbard, 2003; Kelling & Coles, 1997). Using the example of homeless people, Kelling and Coles (1997) agree that this ignores the fact that most homeless are decent, responsible and law-abiding people, with individual emotional, psychological and physical needs that need to be considered (Gold & Revill, 2003; Kelling & Coles, 1997; Phillips & Smith, 2003). While not pre-judging what is or is not 'incivil', the results from this study have empirically identified drug users and gangs as definite signs of disorder. However, this research does not recommend police and other authorities indiscriminately target these social groups in an insensitive manner. In the same token, while stating a large number of people were fearful and avoided Kings Cross because of these environmental cues, other people may be drawn to the area for the sense of excitement that encountering these environmental cues my bring.

11.5.5. Section synopsis: Implications for policy, planning and practice

The avoidance mapping has successfully shown why people are afraid of crime and which environmental cues trigger the most fear of crime. In doing so, it has provided useful knowledge for policy, planning and practice. Generally, this knowledge allows fear reduction efforts to focus on those environmental cues that trigger the most fear of crime. In Kings Cross, these cues would be drug users, gangs and intoxicated persons. Targeting these particular environmental cues could occur through a collaborative approach between police and councils. In terms of policy and planning, the avoidance mapping provides evidence that can corroborate the implementation of existing strategies that focus on these environmental cues for reasons other than fear of crime. Likewise it can indicate a need for additional strategies.

On top of this general information, the avoidance maps showed specific areas that people avoided in reaction to the perceived presence of the different environmental cues. This allows a comparison of the avoided areas and the actual existence and location of the environmental cues in reality. If there is a spatial match between perceptions and reality, the environmental cues could be targeted in the specific areas

that they are a problem. Likewise councils can take a close look at affected sites in terms of potential CPTD strategies. If there is a spatial mismatch between perceptions and reality, then this may provide information about the content, effect and signal value of the environmental cues.

The avoidance maps also provided insights into how different demographic groups experience fear of crime and react to different environmental cues. This was demonstrated by exploring the drug users and sex workers avoidance maps according to the residential status and sex of the respondents. In contrast to the chi-square analysis, which indicated that residents of and visitors to Kings Cross have similar levels of fear, the avoidance maps revealed that they adopted very different avoidance patterns in response to the perceived presence of sex workers and drug users. While the chi-square analysis showed that the female respondents had much higher levels of fear than the male respondents, the avoidance maps illustrated that overall patterns of avoidance for the males and females were more similar than expected given the chi-square result. This exploration of the avoidance maps demonstrated that fear mapping can provide new information concerning public fear of crime that is not apparent through traditional statistical methods.

11.6. An assessment of the research approach

This section outlines the benefits and limitations of the study approach and methods. Benefits and limitations are discussed in relation to the conceptual and measurement approach, survey and interviewing procedure and the avoidance mapping methods.

11.6.1. Advantages of the methods

This section discusses developments arising from the research approach that could be replicated in future studies.

11.6.1.1. Conceptual and measurement approach

This study employed a crime-specific avoidance-based measurement approach to examining 'fear' of 'crime'. Fear of crime was succinctly defined so the survey questions could be tailored accordingly, therefore minimising any potential confusion arising when interpreting the research results. The primary survey question used to investigate people's fear of crime was "do you avoid any areas shown on this map of Kings Cross, because you are afraid of being robbed, beaten or attacked: a) during the day? and b) during the night?" Advantages of the conceptual and measurement approach are discussed here in reference to this survey question.

The study benefited by defining fear as a distinct negative emotion that describes feelings of dread and anxiety, and accordingly targeting fear by using the word 'afraid' in the primary survey question.[271] Using the word 'afraid' reduced the likelihood that the respondents tapped into other emotions or their judgements and concerns. This distinction proved valuable because many of the environmental cues examined in this research could trigger other emotions like anger, or cognitive reactions such as worry. For example despite the fact that sex workers did not trigger a great deal of fear in the respondents, ESNA states that sex workers are a significant problem (ESNA, 2002). While this may appear incongruent, the perceived presence of sex workers can trigger low levels of fear yet still evoke concern for other problematic reasons. Regardless, the design of the primary survey question ensures the resulting avoidance maps do show areas of 'fear', rather than concern for instance.

The conceptual approach has further benefited the study by ensuring the maps show areas of fear of 'crime', as opposed to areas of formless fear.[272] Identifying crime as any act that is a violation of criminal law has resulted in two advantages. Firstly, we can be confident the results do not reflect people's fear of other objects or stimuli. For example two highly ranked cues, laneways and rubbish/syringes, could respectively trigger fear of confined spaces or disease contamination. Clarification that these cues are triggering actual fear of 'crime' is necessary for effective policy, planning and

[271] Which is often omitted from fear of crime survey questions (see section 2.4.1.2 of the literature review chapter).
[272] For example, Darcy's (2003) survey actually investigates formless fear, or sites where people feel unsafe.

practice designed to reduce fear of crime. Going further, it is probable The City focuses on the removal of rubbish/syringes not because they trigger fear of crime but because they are a public liability. However, as fear of crime has the potential to become a significant social problem, evidence that rubbish/syringes also trigger fear of crime could assist The City in identifying their removal as a priority for action. Thus it has been advantageous targeting fear of 'crime'.

Moreover the measurement approach required the use of crime specificity in the survey question, which has ensured the level of fear exhibited by the respondents can be investigated with greater certainty. This is because fear levels vary with the type of crime.[273] The following example explains this using pedestrian absence, triggered an intermediate level of fear of crime. Had people's fear of becoming a victim of theft (steal from person) been investigated, it could be hypothesised pedestrian absence would trigger much less fear, because steal from person incidents can be considered more likely in crowds where pick pocketing is easy. In contrast, had fear of murder been studied, pedestrian absence may have triggered much more fear because murder can be considered more likely in isolated places. Realising different crimes elicit different fear levels and potentially have different environmental cues can have implications for policy, planning and practice. It is therefore important that crime types relevant to the study site and research aims are investigated, as done in this study.

The conceptual definition of fear of crime used in this study acknowledges that signs of disorder and threatening environments, which are not violations of criminal law, can trigger fear of crime. By defining fear of crime in this way, the research responds to a clear need for more environmental fear of crime studies. This has benefited the research by allowing it to successfully bring together the fields of criminology and geography when showing different levels fear of crime and avoidance are triggered by different environmental cues. As discussed in section 2.2 of the literature review chapter, knowledge regarding why people are afraid of crime can be very useful for policing, policy and planning, which further supports the research approach.

[273] As discussed in section 2.4.1.2.a of the literature review chapter.

By employing a behavioural approach to measuring fear of crime, this research has overcome problems of ambiguity inherent in affective approaches. It has also brought other advantages of relevance to policy and planning. Firstly, it allowed the spatial visualisation of fear of crime. Section 2.4.2.2 of the literature review chapter has pointed out that knowing where people are afraid of crime is very useful for fear reduction strategies. Secondly, this measurement approach means the maps not only show areas of fear, but areas that people actually avoid and are therefore vulnerable to decline. Making this distinction is advantageous because the results may become more influential in highlighting the need to address those highly ranked environmental cues that trigger fear of crime in the avoidance hotspots.

11.6.1.2. Survey design and implementation

The survey in this study was designed so that it can be carried out within five minutes from the initial contact with the potential respondent. The time period spent on the majority of the surveys was roughly five minutes. This enabled the respondents to take part in the survey whilst walking down the street or waiting for public transport. Thus the survey was easy to conduct in a short amount of time. Frequently in these circumstances the interviewer read out the survey questions and documented the answers, which also helped reduce the time spent on each interview. The speed of the surveying, combined with the choice of a public street setting, meant a large sample size was obtained. A secondary benefit of the large sample size, and possibly the fact that the questionnaire was titled ‘community safety survey’ rather than ‘fear of crime survey’, was that the sample contained a much higher proportion of male respondents than most other fear of crime surveys. This has provided the research with a valuable opportunity to investigate the nature of men’s avoidance reaction to fear of crime and demonstrate that men are not invulnerable to fear of crime, as may have previously been thought.

The presence of a trained interviewer helped to minimise any respondent misunderstanding of the survey questions. This was particularly relevant to the mapping section of the survey, which for many of the respondents was a new and unfamiliar style of survey. The interviewers frequently told the respondents they could indicate as many avoided areas on the maps as they liked and that the avoided areas

could be as general or specific as they liked. The interviewers were also able to ensure the respondents answered most of the survey questions. For example, survey respondents commonly did not want to answer the question on their income. While respecting this decision, the interviewers could explain how this question was valuable for the study of fear of crime in relation to different socio-demographic groups and the respondents often chose to answer the question.

Most of the respondents did not ask to read the survey information handout, despite being offered it prior to surveying. More often, the interviewers used this sheet to explain who was conducting the research, the purpose of the research and the relevant anonymity surrounding issues discussed in the second methods chapter. Overall, the survey respondents indicated that they were satisfied with the information they had received from the interviewers and were keen to participate. This method of obtaining informed consent proved beneficial and helped foster positive interaction between interviewers and respondents.

11.6.1.3. Mapping methods

While relatively time consuming, the avoidance mapping technique and data preparation was very easy to carry out. People with limited GIS skills could carry out, without much assistance, most of the main steps in the mapping process illustrated in Figure 21 on page 127. This means people could quickly and easily be trained to perform a specific step in the overall mapping process. Should organisations such as the NSW Police, City of Sydney Council or their counterparts in other regions and countries choose to conduct more avoidance mapping surveys, multiple GIS assistants could be trained and contracted to perform much of the GIS work. Only the latter stages of the mapping process, involving the aggregation of individual maps and their visualisation in ArcScene or ArcMap, would need to be performed by someone with proficient GIS skills. Labour costs can therefore be minimised without sacrificing the timeliness of such a project.

Visualisation of the spatial data can also be completed in timely manner and in a way that fosters understanding by the layperson. As discussed in the research design chapter, modelling is carried out on spatial datasets that do not noticeably reveal

patterns, relationships or clustering within the data. Many spatial modelling systems are time consuming and require expensive software licenses and experienced analysts to decipher the output data. It is therefore useful to visualise spatial data in such a way that exposes any patterns, relationships or clustering without complex spatial analysis. The 3D mapping technique employed in this study effectively did so, revealing hotspots of fear and passages of perceived safety that are easily identified, even by people lacking a geographic or spatial background. For example, the fear hotspots can be easily seen as the peaks labelled A, B and C in Figure 84 to Figure 95. In addition, the gradient of the slope analogy means supplementary information about these fear hotspots and the safe thoroughfares through them can be gained. For instance steep gradients on many of the maps clearly define the extent of fear hotspots B and C, indicating that avoidance begins at a common location for many of the respondents. Frequently very steep gradients begin over specific streets, like William Street (see for example Figure 84 and Figure 89), which indicate these streets act as a distinct cognitive barrier between areas perceived as safe and unsafe. The choice of a small $1m^2$ cell size assisted in the visualisation technique, revealing these micro-spatial changes in avoidance that would be lost with larger cell size, as was the case in Darcy's (2003) study. Evidence of micro-scale changes in fear is particularly useful information when it comes to policy and planning in regards to public fear of crime in the region, as is discussed in section 11.4 of this chapter. Nevertheless, the mapping technique can be applied with a larger cell size to accommodate larger research settings. This may be useful to meso-level studies identifying specific cities, neighbourhoods or business districts perceived to be threatening (Fisher & Naser, 1995).

The three-dimensionality also means additional data can be added as a third variable, the surface layer of the 3D maps, to be interpreted with the fear of crime avoidance data. This additional data could be from a variety of sources and come in a variety of formats. The third variable used in this study involves the average extent to which the respondents tried to avoid each area. This data is useful when comparing patterns of avoidance, in terms of avoidance density, with how hard on average the respondents tried to avoid the different fear hotspots and remaining area. However the third variable could, for instance, relate to recorded crime statistics, population statistics or features of the built environment. The 3D mapping is therefore useful to a variety of other investigations into public fear of crime.

11.6.2. Limitations relating to the methods

A few minor limitations became apparent during the interviewing mapping, and analysis. Most of the limitations do not affect this study. Instead they are relevant only to sections of the survey that are not examined in this thesis, can be considered for future spatiotemporal fear of crime studies. The limitations associated with the survey, interviewing procedure and data analysis are discussed in this section.

11.6.2.1. Conceptual and measurement approach

One limitation of the conceptual and measurement approach has presented. The choice of examining people's fear of being robbed, beaten or attacked was based on the fact that these crimes were examined in Doran's (2003) study. However, it would have been better if robbery and/or assault were examined. Robbery is classified by the ABS as an offence category[274], defined as "the unlawful taking of property, with intent to permanently deprive the owner of the property, from the immediate possession, control, custody or care of a person, accompanied by the use, and/or threatened use of immediate force or violence". In contrast, beating and attacking are not classified by the ABS as offence categories. Instead they both fall under the category of assault, which is defined as "the direct (and immediate/confrontational) infliction of force, injury or violence upon a person or persons or the direct (and immediate/confrontational) threat of force, injury or violence where there is an apprehension that the threat could be enacted". The study could have been improved had people's fear of being assaulted been examined instead of fear of being beaten or attacked. This is largely so that a more valid comparison of fear and actual sites of robbery and assault could be made. Additionally, the study would have been enhanced if robbery and assault were examined in different maps, because these crimes may lead to different fear reactions.

[274] Defined in the 1997 Australian Standard Offence Classification (ASOC) - ABS Catalogue Number 1234.0. Latest issue 14/10/1997.

11.6.2.2. The survey and interviewing procedure

After interviewing it became apparent that some of the survey questions had minor weaknesses that were not apparent following the survey pilot trial. While these weaknesses are here, it is important to note that they relate to the general socio-demographic survey questions and not the mapping section. They therefore do not affect the research results, which are based on the data obtained from the mapping section of the survey.

The primary weakness with the socio-demographic survey questions was that most did not offer a 'don't know' or 'not applicable' category. These categories are often omitted from survey questions, to their detriment (Oppenheim, 2001). Only one of the ten general survey questions, Question Eight on respondent confidence in the police, offered a 'don't know' option. It is not clear whether respondents who neglected answering the other survey questions did so because they do not want to answer or because there is no relevant category for them. In light of this, the following table provides reflections on each of the general survey questions.

Table 14. Reflections on the survey questions.

Question and Number of unanswered responses	***Reflections***
Question One: *Sex* *Two responses unanswered*	It would have been more appropriate to use 'gender' rather than 'sex' in this question. An additional category, for example 'other' or 'transgender' should have been provided to account for those respondents not identifying as male or female.
Question Two: *Age* Two responses unanswered	'No answers were assumed to mean the respondents did not want to provide an answer. There was no need for an 'other' or 'not applicable' category in this question.
Question Three: *Housing tenure type* Five responses unanswered	An 'other' category should have been provided to account for any other types of housing tenure types not listed. A 'don't know' category should have been provided for those respondents who did not know their housing tenure.
Question Four: *Residential status* 12 responses unanswered	It is possible an 'other' or 'don't know' category could have been placed in this question. However, those respondents that did not answer this question directly often still answered the related sub-questions. For example if 'no' (not a resident) was not directly ticked, the postcode in the related sub-question may still have been provided, thereby indicating their residential status.
Question Five: *Victimization experience* 250 responses unanswered	'No answers were assumed to mean the respondents had not been victims of crime, however this may not be the case. An 'other' category should have been provided to account for any other types crime not listed. A 'not applicable' category should have been provided. More reflections on this question are provided in the following paragraph.
Question Six: *Reporting crime* 245 responses unanswered	'No answers were assumed to mean the respondents had not a been victim of crime. A 'not applicable' category should have been provided to confirm this interpretation.
Question Seven: *Social integration* 21 responses unanswered	A 'don't know' category should have been provided to account for those respondents who did not know what they or their neighbours would do. More reflections on this question are provided in the paragraph following this table.
Question Eight: *Confidence in the police* One response unanswered	Contained a 'don't know' category.
Question Nine: *Fearfulness* Four responses unanswered	Ambiguities with this global measurement survey question were discussed in section 2.4.1.2.a of the literature review chapter. This question was intentionally included with its inherent problems.
Question Ten: *Income* 30 responses unanswered	A 'don't know' category would have been useful for those respondents who did not know their income. Reflecting, many respondents choose not to give this personal information to the interviewer and as the last question on the survey, some respondents simply ran out of time to finish all the survey questions and therefore left this one.

Additional weaknesses with Questions Six and Seven also presented following the interviewing. Question Six, on reporting crime, could have been adapted to account for those respondents who have been victims of crime in Kings Cross on more than one occasion. Such people could have reported one victimisation and not another. Additional categories could account for this possible response. Question Seven, on social integration, could have produced problems for the respondents. The first potential problem is due to its hypothetical nature. Hypothetical questions are poor predictors of people's future reactions or behaviour, especially to something they have not previously experienced (Oppenheim, 1996). Question Seven is additionally a double-barreled question. It asked respondents what they would do in a given situation and as well as what they thought their neighbours would do. Double-barreled questions like this are problematic because the respondents could have a different answer for each scenario (Oppenheim, 1996). Nevertheless, these two questions are not examined as part of this thesis.

By employing a largely quantitative survey, the data gained in this study could be easily and quickly acquired and analysed. This was beneficial to the study and the development of a avoidance mapping technique. However, it also meant that many of the advantages of qualitative research could not be harnessed. For example if the survey was qualitative, more information could be gained on the respondents' experiences of fear of crime, their mechanisms to cope with it, their patterns of avoidance and responses to those environmental cues that trigger their fear. This would be very valuable information. Therefore the presence of open-ended questions in a future survey is recommended.

While the street-based survey approach was rigorous and necessary to ensure the safety of the interviewers, it had one limitation. By interviewing respondents in the public arena, the interviewers were unable to include the most fearful people in the research sample. Such people comprise of those too afraid to leave their residences, referred to in the literature as "prisoners of their own homes" (Joseph, 1997; Stephens, 1999). This raises the possibility that fear of crime surveys carried out in high crime areas may be harder to manage than other residential surveys. Postal questionnaires are thus recommended to elicit a sample truly representative of those members of the public who are really afraid and confined to their homes. However, as intended in the research

approach chapter, this survey was not intended to be representative of the regional demographic.

A similar limitation of the survey relates to the chosen sampling region and style. Sampling was primarily restricted to the main roads located within the study site, for reasons discussed in section 5.2.3 of the second methods chapter. While this was suitable for the purposes of this study, which was to develop an informative technique for visualising and mapping spatial fear of crime data, it has some drawbacks that will be mentioned. Firstly, had sampling been conducted outside of the study site boundaries or in the smaller roads within the study site, the results may have been different. By carrying out most of the sampling within the study site or along main roads in the region, the sample could have been biased towards those people who are not afraid of crime and do not avoid the area, particularly the main streets. For example, the sampling would not include those people who were actually avoiding the entire Kings Cross area because they were afraid of crime. In contrast, if surveying were to occur over a more expansive street setting it is likely reported avoidance levels would have increased all over the study site, particularly in the main streets where interviewing primarily took place. Had a postal survey been conducted this may have been pronounced, providing the methods for completing the mapping section of the questionnaire were clearly presented.

Another bias in the mapping results may also have resulted from the interviewing procedure. Respondents who were uncertain what to do with the mapping section of the survey were often prompted by asking if they avoided both the main roads and the side streets within the study site. Consequently, many respondents indicated they avoided all side streets and did not avoid the main roads. This response could be considered as biased, having resulted from an interviewer lead. However this is not necessarily the case as the respondents could, and sometimes did, indicate only specific side streets were avoided or main streets used.

Respondents who avoided more than one area of the study site were given the option of associating different environmental cues with each of their avoided areas. However only a couple of the respondents selected different environmental cues for their different avoided areas, either because they chose not to or potentially because

there was some confusion surrounding this option. It is possible the interviewers did not fully understand this part of the survey and the required field coding or did not properly explain the options to the respondents. The fact that different cues were not selected for the different avoided areas has meant the areal difference in avoidance for each environmental[275] cue is not as great as it would be otherwise.

11.6.2.3. Mapping methods

The only limitation with the avoidance mapping methods used in this study is that they are time consuming. However, this can be overcome with more than one person carrying them out. The period of input into the GIS and aggregation could also be minimised if a less thorough geodatabase was required. For example, if the spatial data relevant to each individual respondent did not need to be linked to the demographic data on that respondent. If this were the case, the processes of vectorisation, attribute assigning and rasterisation (see Figure 21 on page 127), would not have been required. However, while these changes would speed the process of map generation, they would not be conducive of a thorough spatial investigation that considered the socio-demographic characteristics of those people who adopted avoidance behaviour, the underlying motivations for avoidance, and the contexts of the avoided areas. This capability is what makes spatial analyses using GIS more valuable than standard cartographic display. It is also what makes this research distinct from previous fear mapping studies, for example those carried out by Fisher and Nasar (1992, 1995), Nasar, Fisher and Grannis (1993), Nasar and Jones (1997).

11.6.2.4. Cognitive mapping

Any potential limitations with the resulting avoidance maps, in terms of their accuracy, largely rest in the fact that avoidance mapping is dependent upon cognitive mapping. Due to the subjective nature of spatial cognition, one's cognitive map can be regarded as incomplete, distorted, schematised, augmented and overly simplified (Downs & Stea, 1973; Nasar, 1998). Consequently, cognitive maps are not representative of reality. Nor are the individual avoidance maps the respondents drew

[275] As was discussed in 8.2.3 of the second results chapter.

necessarily representative of their own cognitive maps. Therefore, the resulting avoidance maps cannot be regarded with absolute authority when it comes to policy and planning, but merely an informative guide to be used in triangulation with other information sources.

People have a tendency to overestimate distances, particularly the spatial extent of familiar and conceptually important areas (Day, 1976). An area worthy of being avoided because one fears being robbed, beaten or attacked could be considered as a conceptually important area. Specifically, Block (1998) states that people usually overestimate short distances and underestimate long distances. This may have occurred when the respondents illustrated the areas that they avoided. It was observed that many survey respondents roughly illustrated the areas that they avoided, rather than going into specific and careful detail. While these possibilities do not discount the spatial maps produced, it can act to encourage more emphasis in the analysis to be placed on the central regions of those avoided areas, rather than on their peripheries. One approach to test validity of the resulting avoidance maps would be to present the respondents with different looking maps of the same area or with maps that have a different scale, and compare the results. However, with the presence of such obvious fear hotspots, safe thoroughfares and cognitive barriers between safe and unsafe areas, which clearly represent consistent public behaviour, it is likely this is not necessary.

11.6.3. Section synopsis: Implications for policy, planning and practice

This study benefits from a well designed conceptual and measurement approach, which has ensured quite unambiguous results. This was accomplished firstly by defining fear of crime as a distinct emotional reaction to the threat of criminal victimisation, and designing the survey accordingly. Secondly, comprehensible results have been promoted by using a crime-specific avoidance-based measurement approach. However, investigating people's fear of being robbed and assaulted, using two different survey questions, would have provided even clearer results than the current investigation of people's fear of being robbed, beaten or attacked. Following the overall success of this research approach, this study recommends future studies adopt a similarly considered approach with even more crime-specificity.

The design of the survey meant it was effectively carried out quickly with standardised interviewing, which facilitated the acquisition of a large quality sample. A few of the general socio-demographic survey questions have some minor weaknesses, which have limited the usefulness of the results they bring. Nevertheless the results from these survey questions have not been examined in this study and therefore do not affect the final thesis. The most pertinent survey questions, those in the mapping section, proved very effective in gaining useful spatial data on fear of crime. Therefore correcting those ambiguous socio-demographic questions and repeating the survey in the same or another region could obtain additional information on spatio-temporal patterns of avoidance.

The spatial fear of crime data was successfully manipulated and displayed using a GIS. The processes of data preparation can be replicated and easily carried out by multiple people with limited GIS skills. This makes the GIS methods easy to adopt by police and government organisations that could employ numerous people to conduct this time consuming process in a short time period. The data visualisation technique is very effective in revealing general patterns of avoidance, areas perceived to be safe and fear hotspots that can be easily interpreted. The three-dimensionality of the avoidance maps has also allowed the visualisation of fear of crime with other variables, enabling more extensive investigations into the association between fear of crime and it's influencing factors. For example, future investigations could adopt the GIS methods to provide an in-depth investigation into fear of crime and the actual presence of crime and environmental cues, or other factors of the environment.

11.7. Summary of the discussion

This chapter has discussed the research findings and the implications of knowing where, when and why people feel afraid of crime in Kings Cross. Overall, the research approach and methods have been appropriate for this spatiotemporal investigation into fear of crime and the environmental cues that trigger avoidance. The advantages of the methods far out way the minor limitations. The following chapter will conclude the thesis by summarising this discussion and providing recommendations for future research, policy, planning and practice.

12. Conclusions and Recommendations

This chapter summarises and concludes the preceding discussion of the major research findings. The conclusions generally address the research aims before reviewing the research findings and their implications for policy, planning and practice in more detail. The last section of the chapter looks to the future of the research field and the use of avoidance mapping.

12.1. Addressing the research aims

This study has drawn on the fields of criminology and geography to provide a spatiotemporal investigation into fear of crime. The research has adopted a distinctive environmental perspective and a well-founded approach to defining and measuring fear of crime. A visual-diagnostic technique for mapping areas people avoid when they are afraid of crime was then developed. In accordance with the research aims, the resulting avoidance maps have allowed the investigation of where, when and why people are afraid of crime in Kings Cross. By specifically focussing on why people are afraid of crime, the avoidance maps have enabled a unique and thorough exploration into the environmental cues that triggered people to feel afraid of being robbed, beaten or attacked. This has not previously been done in a spatially explicit way. Additionally, the avoidance maps have allowed the avoidance reaction of different socio-demographic groups to be studied, something not well explored in the literature. Therefore by visualising the spatial fear of crime data and examining the resulting avoidance maps, this study has provided information relevant to the following questions:

- Are people afraid of crime?
- When are people afraid of crime?
- Where are people afraid of crime?
- Why are people afraid of crime?
- Who is afraid of crime?

While these questions have been addressed in earlier studies, the findings from this research provide new information concerning public fear of crime that have not been

available using earlier techniques for examining fear of crime. This new information does have useful implications for theory, policy, planning and practice. This is reviewed in more detail in the following section.

12.1.1. People are afraid of crime

The study finds that people are afraid of crime in Kings Cross and provides confirmation that people do react through avoidance when they experience this fear. The avoidance levels in Kings Cross are high, with 36% and 66% of the respondents avoiding at least one area of the study site during the day and night respectively. The literature suggests that these elevated levels of fear could have numerous negative social, physical and economic consequences for Kings Cross. Considering the possibility of these consequences, the unequivocal evidence of an avoidance reaction is significant and points towards the need for fear of crime reduction strategies in Kings Cross. These strategies could be covered in The City's 'Safe City Program'.

12.1.2. People are afraid of crime during the day and night

The research results indicate that levels of fear of crime and avoidance during the night were nearly double that during the day. The finding that fear of crime is greater during the night than the day is consistent with the results from other fear of crime studies that attribute this increase in fear to the onset of darkness. The results confirm that poor street lighting during the night is a significant trigger of fear of crime. However, the results also reveal that the 15 other environmental cues also triggered heightened levels of fear during the night. This confirms that other social and physical environmental cues may need to be addressed if fear of crime in Kings Cross is to be reduced.

12.1.3. People are afraid of crime in specific fear hotspots

The avoidance maps show that there are common patterns of avoidance throughout the study site. Noticeably, William Street appears to be a distinct barrier between areas

commonly perceived to be safe (the south of the study site) and unsafe (the north of the study site). This finding has implications for cognitive mapping studies, verifying that the public uses recognisable landmarks to guide their spatial behaviours in response to fear of crime. Fear of crime in Kings Cross predominates north of William Street in three fear hotspots. These hotspots are over central Woolloomooloo and in two street blocks either side of Darlinghurst Road. The avoidance mapping technique therefore allows for any fear reduction strategies, for instance increasing police presence or conducting CPTED initiatives, to be focussed on these high fear areas. This is significant because by targeting the fear hotspots, limited public resources can be utilised more efficiently and effectively, potentially with increased chances of successfully combating fear of crime in the most critical places.

Levels of fear and avoidance were comparatively low in the southern half of the study site and along Darlinghurst Road, MacLeay and Victoria Streets. The avoidance maps indicate these streets in particular are considered distinctly safe thoroughfares through the three fear hotspots. This finding suggests that, in regards to fear of crime, governments and the police do not need to direct their resources to these streets. However, because these streets actually divide the fear hotspots, an assessment into why they do not trigger as much fear of crime and avoidance than the surrounding area may be worthwhile. Such a study could provide insights into the presence of safe cues and the signal value of environmental cues, thereby providing useful information for fear reduction strategies in other areas.

In addition to illustrating common patterns of avoidance, the avoidance maps also reveal subtle changes in avoidance levels throughout the study site. These consist of small areas of increased avoidance levels situated beyond the fear hotspots, for example under the rail viaduct in the south of Woolloomooloo. With such detailed results, the avoidance maps even have value in providing an evidence base for very localised fear reduction strategies, for instance improving amenity under the rail viaduct or placing a CCTV camera there. Similarly, such detailed results also enable the development sites and strategies proposed in in-depth neighbourhood-specific plans and policies to be considered in regards to fear of crime. For instance, after assessing the 2006 City Plan in light of the avoidance maps a few changes to the Plan appeared suitable, thereby demonstrating the potential applications of avoidance mapping.

12.1.4. People's fear of crime is triggered by different environmental cues

The research finds that environmental cues did trigger fear of crime and avoidance in Kings Cross. The results also indicated that different environmental cues have different signal values and triggered different levels of fear of crime, as suggested by the signal crimes perspective. This information is useful in terms of combating fear of crime because, for example, more resources can be aimed at targeting drug users than sex workers. Moreover, knowing which environmental cues trigger fear of crime is important because different environmental cues need to be dealt with using different strategies. For instance problems associated with gangs are more likely to be addressed by police through intelligence, whereas areas to hide are more likely to be addressed by council through CPTED. The avoidance maps also illustrated that fear of crime triggered by different environmental cues is also expressed through different patterns of avoidance. Comparing the avoidance maps for sex workers and drug users revealed the very different levels and patterns of avoidance. This indicates that the situational context of environmental cues also plays a role in whether they trigger fear of crime and how that fear manifests through avoidance. By indicating which environmental cues trigger fear of crime and where, the avoidance maps can also enable fear reduction strategies to target the pertinent environmental cues in the most appropriate areas. This could increase the chances of successfully combating fear of crime while minimising resource expenditure.

The environmental cues avoidance maps can be used to compare fear of crime with actual presence of the environmental cues. This is useful as the avoidance maps could potentially alert the government and police to areas of disorder that they were previously unaware of. Areas of increased avoidance on the sex workers and drug users avoidance maps, mostly reflected the actual presence of street sex workers and commercial brothels and sites where drug users and dealers are known to be operating. However, increased avoidance around Sydney Place notified the police of unreported drug dealing in the area. The avoidance maps therefore assisted the police in focussing intelligence to the area. Similarly, the finding that avoidance did not always increase

around council syringe bins might indicate drug users are not using some bins and that the bins could be relocated to more suitable locations.

The gangs avoidance maps also demonstrated that the avoidance maps can provide information on how people interpret and render meaningful signs of disorder and crime. The gangs avoidance maps indicated that avoidance is very high and generalised throughout the study site despite the fact that gangs are not considered to be currently operating in the area. This finding could indicate that the historical context and reputation of an area, rather than the reality of actual crime and disorder, can be responsible for fear. It could also suggest that gangs have a high signal value, potentially because they denote the possibility of severe crimes. This is useful information as it clarifies the need for attempting to combat fear of crime by altering public perceptions of disorder. Providing the public with information that gang related crime in Kings Cross is rare and unlikely could do this.

The areas to hide avoidance maps provide another example of quite different results, with moderate, yet very generalised avoidance. Accounting for the spatial generalisation in avoidance could be that areas to hide are present in all areas of the study site, or that the respondents had trouble visualising the location of this environmental cue. Due to the little variation, the avoidance maps are not particularly useful for policy and planning in terms of targeting specific locations.

12.1.5. Socio-demographic groups have different fear of crime levels and avoidance patterns

The results also provide new information that different socio-demographic groups experience different levels of fear of crime and, more importantly, adopt different patterns of avoidance. For instance, the visitors experienced much higher levels of fear of crime and avoided more generalised areas than the residents. Realising social groups react differently to fear of crime means fear reduction strategies can target more fearful groups, like visitors rather than residents. For example, investing in advertising that encourages visitors to Kings Cross and improves the reputation of the area may be more successful in decreasing local fear of crime than crime reports distributed in Kings Cross community meetings. The localised areas avoided by the residents are those

linked to the presence of sex workers, drug users and drug dealers in reality. Unlike the residents, the visitors did not appear to know the actual locations of these groups and were much more likely to avoid large areas in an attempt to reduce the likelihood of victimisation.

The sex workers and drug users avoidance maps moreover illustrate differences and similarities in men and women's experience of fear of crime. For the most part, more female respondents than male respondents adopted avoidance behaviour because of the presence of sex workers and drug users. This finding is not surprising since the literature indicates women have more vulnerabilities then men, which increases their fear of crime. However, the drug users avoidance maps do show that both the male and female respondents experience high levels of fear of crime. During the day there are some slight differences in avoidance patterns, however during the night the avoidance patterns adopted by the male and female respondents are very similar, showing the same areas are avoided. This demonstrates that fear triggered by drug users is not solely a women's problem, like the literature might suggest, and that males also are affected. Likewise, the sex workers avoidance maps showed that the overall patterns of avoidance adopted by the male and female respondents were quite similar. While this information may not be particularly relevant to policy and planning, it is quite interesting for the research field because experiences of fear of crime is thought to be very different for men and women.

12.2. The future of fear mapping

The avoidance maps developed and investigated in this research have clearly produced some new and useful information concerning public fear of crime. Given this, there is a great potential for future fear of crime studies to adopt a similar research approach. This section anticipates the direction of future fear of crime studies and foresees some advancements in the future of avoidance mapping.

Firstly in regards to the research field, it is possible there will be an increase in the number of fear of crime studies in general. This is predictable as governments, police departments and communities begin to recognise how fear of crime may be affecting

their organisations and neighbourhoods. Increased concern and research is likely to occur in countries where there has been limited fear of crime research in the past, for example Australia. Yet a revitalisation and resurgence of the field could also occur in countries such the UK or USA that have a history of fear of crime research and an acknowledgement of the potential social problem. Fear of crime research in these countries has arguably become somewhat stagnant with the overuse of traditional statistical investigation techniques. These have failed to provide much new and useful information over the last few decades. However, with the demonstrated success of avoidance mapping in providing fresh information with clear implications, interest in fear of crime by researchers in these countries may be renewed. The practicality of the survey and mapping techniques developed in this study and the fact that they are easily transferable to other countries and contexts may also help to encourage the onset of avoidance mapping in these regions.

Moving on from the research field in general, conclusions can be made regarding the approach new studies will adopt when examining fear of crime. Starting with the conceptual and measurement approach it is hoped that, like this study, new investigations will dispense with those traditional techniques that have stilled the research field. To begin with, the conceptual and measurement approach exercised in this research is refined. This has been fundamental to the production of results that can be interpreted with little ambiguity. For example, results that do not confuse fear of crime with general anxiety, opinions about crime or as a single common response to varied types of crime. Due to the history of vague results from poorly designed research approaches, it is expected prospective studies will also place comparable emphasis on conceptualising, defining and measuring fear of crime.

More specifically in terms of measurement, this research has principally demonstrated the benefit of measuring fear of crime through avoidance. The chief advantages are that avoidance can be objectively interpreted, is quantifiable, is mappable, and is most pertinent to the negative consequences of fear of crime. Therefore it is predicted that future studies will also measure fear of crime through avoidance. However, there is also much room for research that examines people's other behavioural responses to fear of crime, which also overcome the problems with subjective evaluations of verbal emotional statements. Thus there maybe a decrease in

the implementation of more spatially general cognitive or affective based studies, except for when it comes to broad level analyses.

It is suggested that prospective fear of crime research employ surveys with more open-ended questions than was used in this study, thereby assisting researchers to gain more comprehensive understanding of public perceptions of environmental cues and safe cues. For instance, open-ended questions could be used to investigate the signal value of specific signs of disorder. It is also recommended, if resources permit, that postal surveys are used to sample those individuals who are so afraid of crime that they avoid the public street setting altogether. The postal sampling should also include people living in suburbs beyond the study site, thereby also including potential visitors to the area.

The most beneficial aspect of the research approach developed in this study is that it has enabled fear of crime to be spatiotemporally investigated. This has provided the most useful implications for policy, planning and practice because, as discussed earlier, it allows the targeting of limited resources to areas in need. The method of avoidance mapping developed in this research can easily be carried out, which may also encourage the adoption of avoidance mapping by research and other organisations. Apart from the implications of avoidance mapping previously mentioned in the previous section, there are many other potential benefits arising from avoidance mapping.

By mapping fear of crime in the same region over time, spatiotemporal investigations could feature prominently in longitudinal fear of crime studies. In this way avoidance mapping could provide a useful measure for documenting levels of avoidance before and after the implementation of fear or crime reduction strategies and disorder manaement. Thus spatiotemporal studies could create an even greater evidence base supporting or disputing the success of certain policies, plans and practices aiming to combat fear of crime. This would be particularly applicable in government organisations that are accountable to the public for their actions and the expenditure of resources. Furthermore, longitudinal avoidance mapping would allow the broken windows and disorder and decline theories to be systematically tested. Such investigations could have vast consequences for the field as many fear of crime reduction schemes are based on the premise of the disorder-fear-crime feedback loop.

There are other aspects of the avoidance mapping technique that could also be amended to lead to new findings. For example, avoidance maps can be produced for other crimes that were not examined in this study or for robbery and assault separately. New maps could also illustrate fear of crime triggered by the perceived presence of different environmental cues. For instance the 16 environmental cues explored in this study may not be relevant to other research settings and could be replaced by other cues. Likewise, some of the environmental cues investigated in this study could be broken down further to assist with the interpretation of public perceptions of disorder. For example, *drug users* could be categorised by type of drug and *gangs* could be defined more explicitly as organised criminal groups or otherwise. Similarly, the perceived presence of safe cues could also be mapped in association with fear levels. Another example is that the patterns of avoidance adopted by other socio-demographic groups can also be investigated through avoidance mapping. With these options there are many possibilities for future fear mapping studies.

The value of the third dimension in the avoidance maps also creates the opportunity for new research to spatially examine the association between fear of crime and other variables. In line with what is explored in this research, these variables could include the actual location of crime, disorder and threatening environments. Similarly, patterns of fear of crime could be compared to spatial variation in other mappable environmental characteristics like primary landuse type, income or social-disadvantage. Fear of crime could also be mapped with other public perceptions. For instance drawing on the social fear of crime theories, additional variables might include areas where people are concerned about social integration, diversity or change. Thus, there is the potential for much spatial research that cannot be performed using traditional statistical techniques.

12.3. Final thesis statement

In conclusion, this research has demonstrated that avoidance mapping can provide much new information concerning where, when and why people are afraid of crime. This new information has useful implications for policy, planning and practice. Given this, it is hoped new studies will also incorporate spatiotemporal visualisation into their fear of crime research.

13. References

Australian Bureau of Statistics, 2006: *General Social Survey (cat no. 4159.0)*, Australian Bureau of Statistics, Commonwealth of Australia, Canberra.

Australian Bureau of Statistics, 2005: *The 2005 Crime and Safety Survey (cat no. 4506.0)*, Australian Bureau of Statistics, Commonwealth of Australia, Canberra.

Australian Bureau of Statistics, 2002a: *The 2002 Crime and Safety Survey (cat no. 4506.0)*, Australian Bureau of Statistics, Commonwealth of Australia, Canberra.

Australian Bureau of Statistics, 2002b: *2001 Census basic community profile 2011 (poa2011)*, Australian Bureau of Statistics, Commonwealth of Australia, Canberra.

Australian Bureau of Statistics, 2002c: *2001 Census basic community profile Sydney (ucl 171400)*, Australian Bureau of Statistics, Commonwealth of Australia, Canberra.

Adams, R.E., Rohe, W.M. and Arcury, T.A., 2005: 'Awareness of community-oriented policing and neighborhood perceptions in five small to midsize cities', *Journal of Criminal Justice*, 33(1): 43-54.

Allen Jack and Cottier Inc (AJC), 2006: *Draft master plan report: Urban design study - City East and Darlinghurst / Surry Hills*, Allen Jack and Cottier Inc. for City of Sydney Council, Sydney.

Akers, R.L., Greca, A.J. and Sellers, C., 1987: 'Fear of crime and victimization among the elderly in different types of communities', *Criminology*, 25(3): 487.

Amerio, P. and Roccato, M., 2005: 'A predictive model for psychological reactions to crime in Italy: An analysis of fear of crime and concern about crime as a social problem', *Journal of Community and Applied Social Psychology*, 15(1): 17-28.

Ashby, D.I. and Longley, P.A., 2005: 'Geocomputation, geodemographics and resource allocation for local policing', *Transactions in GIS*, 9(1): 53.

Australian Explorer, 2005: *Kings Cross*, Australian Explorer, Available at: http://www.australianexplorer.com/Sydney_kings_cross.htm. Accessed: 18/10/05.

Baker, T. and Wolfer, L., 2003: 'The crime triangle: Alcohol, drug use and vandalism', *Police Practice and Research*, 4(1): 47-61.

Bannister, J. and Fyfe, N., 2001: 'Introduction: Fear and the city', *Urban Studies*, 38(5-6): 807-813.

Bauman, Z., 2000: 'Social uses of law and order', in *Criminology and social theory*, eds. D. Garland and R. Sparks, Oxford University Press, Oxford.

Beck, U., 1992: *Risk society: Towards a new modernity*, Sage, London.

Bennett, T., 1991: 'The effectiveness of a police-initiated fear-reducing strategy', *British Journal of Criminology*, 31(1): 1-14.

Blalock, H., 1967: *Toward a theory of minority group relations*, John Wiley and Sons, New York.

Block, R., 2000: 'Cross national comparison of victims of crime: Victim surveys of twelve countries', in *The fear of crime*, eds. J. Ditton and S. Farrall, Aldershot, Ashgate, pp. 13-37.

Blumer, H., 1969: *Symbolic interactionism*, University of California Press, Berkley.

Borooah, V. and Carcach, C., 1997: 'Crime and fear. Evidence from Australia', *British Journal of Criminology*, 37(4): 635-657.

Bowers, K.J., Johnon, S.D. and Ken, P., 2004: 'Prospective hot-spotting: The future of crime mapping?'

British Journal of Criminology, 44: 641-658.

Bowling, B., 1999: 'The rise and fall of New York murder: Zero tolerance or crack's decline?' *The British Journal of Criminology,* 39(4): 531-554.

Box, S., Hale, C. and Andrews, 1988: 'Explaining fear of crime', *The British Journal of Criminology,* 37(4): 340-356.

Braithwaite, J., 2000: 'The new regulatory state and the transformation of criminology', in *Criminology and social theory,* eds. D. Garland and R. Sparks, Oxford University Press, Oxford.

Braithwaite, D., 23/8/2007: 'Raids target robbery and bikie gangs', *Sydney Morning Herald*.

Braithwaite, D. and Baker, J, 11/8/2007: 'Elusive, but they're no pimpernels', *Sydney Morning Herald*.

Brantingham, P.L. and Brantingham, P.J., 1993: 'Nodes, paths and edges: Considerations of the complexity of crime and the physical environment', *Journal of Environmental Psychology*, 13: 3-28.

Brantingham, P.L. and Brantingham, P.J., 1995: 'Criminality of place: Crime generators and crime attractors', *European Journal on Criminal Policy and research*, 3(3): 5-26.

Briscoe, S. and Donnelly, N., 2001a: 'Temporal and regional aspects of alcohol related violence and disorder', *Alcohol Studies Bulletin,* 1: 1-14.

Briscoe, S. and Donnelly, N., 2001b: 'Assaults on licensed premises in inner-urban areas', *Alcohol Studies Bulletin,* 2: 1-14.

Brown, B., Perkins, D.D. and Brown, G., 2003: 'Place attachment in a revitalizing neighborhood: Individual and block levels of analysis', *Journal of Environmental Psychology,* 23(3): 259-271.

Brown, M. and Polk, K., 1996: 'Taking fear of crime seriously: The Tasmanian approach to community crime prevention', *Crime and Delinquency,* 42(3): 398-420.

Brunt, P., Mawby, R. and Hambly, Z., 2000: 'Tourist victimisation and the fear of crime on holiday', *Tourism Management,* 21(4): 417-424.

Burgess, M., 2004: *Fear of crime: Spatiotemporal patterns of avoidance in Kings Cross*, Australian National University, Canberra.

Burnett, P., 1976: 'Behavioural geography and the philosophy of the mind', in *Spatial choice and spatial behaviour*, eds Golledge, R. and Rushton, G., Ohio State University Press, Ohio, pp. 23-50.

Bursik, R.J., 1988: 'Social disorganisation and theories of crime and delinquency', *Criminology,* 26: 519-551.

Bursik, R.J. and Webb, J., 1982: 'Communities change and patterns of delinquency', *American Journal of Sociology*, 88:24-42.

Butel, E. and Thompson, T., 1984: *King's Cross album,* Atrand, Sydney.

Byrne, W., 11/5/1999: 'Swap mean streets for clean streets', *The Sydney Morning Herald*.

Cameron, S. and Field, A., 2000: 'Community, ethnicity and neighbourhood', *Housing Studies*, 15: 827-843.

Cameron, D., 7/2/2002: 'News and features - respect family - Moroney's crime fighting motto', *The Sydney Morning Herald*.

Capobianco, L., 2006: *Public-private-community action towards safety: A focus on housing in disadvantaged neighbourhoods,* International Centre for the Prevention of Crime, Quebec.

Carcach, C. and Mukherjee, S., 1999: 'Women's fear of violence in the community', *Trends and Issues in Crime and Criminal Justice,* November: 1-6.

Carlson, J. and Hatfield, E., 1992: *Psychology of emotion,* Harcourt Brace Jovanovich College Publishers, Fort Worth.

Carvalho, I. and Lewis, D.A., 2003: 'Beyond community: Reactions to crime and disorder among inner-city residents', *Criminology,* 41(3): 779-812.

Cates, J.A., Dian, D.A. and Schnepf, G.W., 2003: 'Use of protection motivation theory to assess fear of crime in rural areas', *Psychology Crime and Law,* 9(3): 225-236.

Chadee, D., Austen, L. and Ditton, J., 2007: 'The relationship between likelihood and fear of criminal victimisation: Evaluating risk sensitivity as a mediating concept', The British Journal of Criminology, 47: 133-153.

Chadee, D. and Ditton, J., 2003: 'Are older people most afraid of crime? Revisiting Ferraro and Lagrange in Trinidad', *The British Journal of Criminology,* 43(2): 417-433.

Chiricos, T., Hogan, M. and Gertz, M., 1997: 'Racial composition of neighborhood and fear of crime', *Criminology,* 35(1): 107.

Chiricos, T., Padgett, K. and Gertz, M., 2000: 'Fear, TV news, and the reality of crime', *Criminology,* 38(3): 755.

City of Sydney Council (CoSC), 1999: *The City of Sydney policy for the management of laneways in central Sydney,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2000: *The City of Sydney exterior lighting strategy,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2001: *Central Sydney development control plan 1996 - Consolidated 2001,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2003: *Aerosol art and graffiti,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2004a: *Redfern-Waterloo community safety plan 2005,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2004b: *The City of Sydney graffiti management policy,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2005a: *Central Sydney local environment plan 1996 consolidated 2005,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2005b: *City of Sydney syringe management plan 2005-2010,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2005c: *Draft liquor bill 2005,* City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2005d: *Kings Cross and surrounds,* City of Sydney Council, Available at: http://www.cityofsydney.nsw.gov.au/AboutSydney/CityLocalities/KingsCrossandSurrounds.asp. Accessed: 18/10/05.

City of Sydney Council (CoSC), 2005e: *Meeting minutes 05/12/05,* City of Sydney Council, Available at: http://www.cityofsydney.nsw.gov.au/Council/documents/meetings/2005/Planning_051205/05-12-05_PDTC_ITEM9.pdf Accessed: 23/8/06.

City of Sydney Council (CoSC), 2005f: *Response to community concerns,* City of Sydney Council, Available at: http://www.cityofsydney.nsw.gov.au/Community/documents/CommunityForums/QA_KingsCross281105.pdf Accessed: 22/8/06.

City of Sydney Council (CoSC), 2006a: Accords with licensed premises, City of Sydney Council, Available at:

http://www.cityofsydney.nsw.gov.au/Community/Safety/AccordWithLicensedPremises.asp. Accessed: 22/6/06.

City of Sydney Council (CoSC), 2006b: *Alcohol and licensed premises*, City of Sydney Council, Available at: http://www.cityofsydney.nsw.gov.au/Community/Safety/AlcoholSafety.asp#Downloads. Accessed: 22/6/06.

City of Sydney Council (CoSC), 2006c: *Alcohol free zones*, City of Sydney Council, Available at: http://www.cityofsydney.nsw.gov.au/Community/Safety/AlcoholFreeZones.asp. Accessed: 22/6/06.

City of Sydney Council (CoSC), 2006d: *Alcohol summit submission one: Responsible supply and consumption*, City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2006e: *Alcohol summit submission two: Alcohol related crime and anti-social behaviour*, City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2006f: *Alcohol summit submission three: Alcohol related crime and anti-social behaviour*, City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2006g: 'Building a stronger and safer community', *A safer community*, 3.

City of Sydney Council (CoSC), 2006h: *City of Sydney adult entertainment and sex industry premises development control plan 2006*, City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2006i: *City of Sydney strategic plan 2006-2009*, City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2006j: *Drug safety*, City of Sydney Council, Available at: http://www.cityofsydney.nsw.gov.au/Community/Safety/DrugSafety.asp. Accessed: 22/6/06.

City of Sydney Council (CoSC), 2006k: *Education and safety campaigns*, City of Sydney Council, Available at: http://www.cityofsydney.nsw.gov.au/Community/Safety/EducationAndCampaigns.asp. Accessed: 22/6/06.

City of Sydney Council (CoSC), 2006l: *Flier: Security and safety tips*, City of Sydney Council, Sydney.

City of Sydney Council (CoSC), 2006m: *Safe city program*, City of Sydney Council, Available at: http://www.cityofsydney.nsw.gov.au/Community/Safety/SafeCityProgram.asp. Accessed: 22/6/06.

City of South Sydney Council (CoSS), 1997a: *Strategy for a sustainable City of South Sydney*, City of South Sydney, Sydney.

City of South Sydney Council (CoSS), 1997b: The South Sydney Plan, City of South Sydney Council, Sydney.

City of South Sydney Council (CoSS), 2000: *City of Sydney adult entertainment and sex industry premises development control plan 2006*, South Sydney Council Sex Industry Policy 2000, Sydney.

Clark, J., 2003: 'Fear in fear-of-crime', *Psychiatry, Psychology and Law*, 102: 267-282

Clarke, R., 1980: ‘Situational crime prevention: Theory and practice’, *British Journal of Criminology*, 20(2): 136-147.

Clarke, A.H. and Lewis, M.J., 1982: 'Fear of crime among the elderly', *The British Journal of Criminology, Delinquency and Deviant Social Behaviour*, 22(1): 49.

Clemente, F., 1977: 'Fear of crime in the United States: A multivariate analysis', *Social Forces*, 56(2): 519.

Cochran, J.K., Bromley, M.L. and Branch, K.A., 2000: 'Victimization and fear of crime in an entertainment district crime "hot spot:" A test of structural-choice theory', *American Journal of Criminal Justice*, 24(2): 189.

Cohen. L.E. and Felson, M., 1979: Social change and crime rates and trends: A routine activity approach', *American Sociological Review*, 44(4): 588-608.

Cornell, A., 13/7/2002: 'In thrall to crime', *The Australian Financial Review*.

Cornish, D., and Clarke, R.V., 1986: The resoning criminal: Rational choice perspectives on offending, Springer, New York.

Couclelis, H., 1998: 'Aristotelian spatial dynamics in the age of GIS'. In *Spatial and temporal reasoning in Geographic Information Systems*. eds. M. Egenhofer, and R. G. Golledge, 109-18. New York: Oxford University Press.

Coumarelos, C., 2001: *Evaluation of the safe city strategy in central Sydney*, Sydney, New South Wales Bureau of Crime Statistics and Research.

Covington, J. and Taylor, R.B., 1991: 'Fear of crime in urban residential neighbourhoods: Implications between - and within - neighbourhood sources for current models', *The Sociological Quarterly*, 32(2): 231-249.

Cozens, P., Hillier, D. and Prescott, G., 2001: 'Crime and the design of residential property - exploring the perceptions of planning professional, burglars and other users Part 2', *Property Management*, 19(4): 222.

Cozens, P.M., 2002: 'Sustainable urban development and Crime Prevention Through Environmental design for the British city. Towards an effective urban environmentalism for the 21st century', *Cities*, 19(2): 129-137.

Centre for Problem-Oriented Policing (CPOP), 2003: What is problem-oriented policing?, Available at: http://www.popcenter.org/about-whatisPOP.htm; http://www.popcenter.org/about-keyelements.htm; http://www.popcenter.org/about-situational.htm; http://www.popcenter.org/about-SARA.htm. Accessed: 19/04/2006, 19/04/2006.

Crank, J.P., Giacomazzi, A. and Heck, C., 2003: 'Fear of crime in a non-urban setting', *Journal of Criminal Justice*, 31(3): 249-263.

Crowe, T.D., 1991: 'Safer schools by design', *Security Management*, 35(9): 81.

Cummings, A, 17/6/2007: 'Police get tough on bikies for club chaos', *Sydney Morning Herald*.

Curtis, A. and MacPherson, A., 1996: 'The zone definition problem in survey research: An empirical

Dammert, L. and Malone, M.F.T., 2003: 'Fear of crime or fear of life? Public insecurities in Chile', *Bulletin of Latin American Research*, 22(1): 79-101.

Darcy, D., 2003: *The highs and lows of dealing with disorder: The Kings Cross police experience*, Proceedings from the Graffiti and Disorder Conference, Brisbane, 18-19 August, 2003.

Darcy, D., Personal communication, 12 March 2004.

Darcy, D., Personal communication, 17 March 2004.

Darcy, D., 2005: 'Policing the socially disadvantaged, the value of rekindling community policing in Wolloomooloo: A police commander's perspective', *Current Issues in Criminal Justice*, 17(1): 144-153.

Day, R.A., 1976: 'Urban distance cognition: Review and contribution', *Australian Geographer*, 13: 193-200.

Dean, M., 1999: 'Risk, calculable and incalculable', in *Risk and sociocultural theory*, ed. D. Lupton, Cambridge University Press, Cambridge, pp. 131.

DeFronzo, J., 1979: 'Fear of crime and handgun ownership', *Criminology*, 17(3): 331-339.

Devine, M., 8/11/2001: 'Victims a screaming, but no one hears', *The Sydney Morning Herald*.

Dietz, A.S., 1997: 'Evaluating community policing: Quality police service and fear of crime', *Policing*, 20(1): 83.

Ding, Y. and Fotheringham, S., 1992: 'The integration of spatial analysis and GIS', *Computing, environment and urban Systems*, 16.

Ditton, J., 2000: 'Crime and the city', *The British Journal of Criminology*, 40(4): 692-709.

Ditton, J., Bannister, J., Gilchrist, E. and Farrell, S., 2000: 'Afraid or angry? Recalibrating the fear of crime', in *The fear of crime* eds. J. Ditton and S. Farrall, Aldershot, Ashgate, pp. 535-552.

Ditton, J., Chadee, D., Farrall, S., Gilchrist, E. and Bannister, J., 2004: 'From imitation to intimidation - a note on the curious and changing relationship between the media, crime and fear of crime', *British Journal of Criminology*, 44(4): 595-610.

Doeksen, H., 1997: 'Reducing crime and the fear of crime by reclaiming New Zealand's suburban street', *Landscape and Urban Planning*, 39(2-3): 243-252.

Doran, B.J., 2004: *A spatiotemporal investigation into fear of crime in Wollongong, New South Wales, Australia*, Australian National University, Canberra..

Doran, B.J. and Lees, B.G., 2003: *Using GIS to investigate spatiotemporal links between disorder, crime and the fear of crime*, Proceedings from the Conference, Graffiti and Disorder Conference, Brisbane.

Doran, B.J. and Lees, B.G., 2005: 'Investigating the spatiotemporal links between disorder, crime, and the fear of crime', *Professional Geographer*, 57(1): 1-12.

Downs, R.M. and Stea, D., 1973: 'Cognitive maps and spatial behaviour: Processes and products', in *Image and environment* eds. R.M. Downs and D. Stea, Edward Arnold, Great Britain, pp. 1-8.

Drummond, W.J., 1995: 'Address matching: GIS technology for mapping human activity patterns', *Journal of the American Planning Association*, 61(2): 240-251.

Department for Transport, Urban Planning and the Arts (DTUPA), and Planning South Australia, 2002: *Crime Prevention Through Environmental Design and urban design: Design issues for safe neighbourhoods* , Department for Transport, Urban Planning and the Arts and Planning South Australia, Adelaide.

DuBow, F., McCabe, E., Kaplan, G., 1979: *Reactions to crime: A critical review of the literature*, US Department of Justice, Washington DC.

Eco, U., 1976: *A theory of semiotics*, Indiana University Press, Bloomington.

Ellis, R. and Stacey, W., 1971: *Kings Cross - Sydney*, Thomas Nelson, Sydney.

Eastern Suburbs Neighbourhood Association (ESNA)., 2002: *East Sydney community strategic plan*, Eastern Suburbs Neighbourhood Association Inc., Sydney.

Eastern Suburbs Neighbourhood Association (ESNA), Undated: *Policy paper: Location of street worker houses*, Eastern Suburbs Neighbourhood Association Inc., Sydney.

Evans, D.J. and Fletcher, M., 2000: 'Fear of crime: Testing alternative hypotheses', *Applied Geography*, 20(4): 395-411.

Ewald, U., 2000: 'Criminal victimisation and social adaptation in Germany: Fear of crime and risk perception in the new germany', in *Crime, risk and insecurity* eds. T. Hope and R. Sparks, Routledge, London, pp. 166.

Beck, U., 1992: Risk society: Towards a new modernity, Sage, London.

Brantingham, P.L. and Brantingham, P.J., 1993: 'Nodes, paths and edges: Considerations of the complexity of crime and the physical environment', Journal of Environmental Psychology?, 13(3-28.

Farrall, S., Bannister, J., Ditton, J. and Gilchrist, E., 2000: 'Social psychology and the fear of crime', *The British Journal of Criminology*, 40(3): 399-413.

Farrall, S., Bannister, J., Ditton, J. and Gilchrist, E., 1997: 'Questioning the measurement of the 'fear of crime': Findings from a major methodological study', *The British Journal of Criminology,* 37(4): 658-679.

Farrall, S., Bannister, J., Ditton, J. and Gilchrist, E., 2000: 'Social psychology and the fear of crime', *The British Journal of Criminology*, 40(3): 399-413.

Farrall, S. and Ditton, J., 1999: 'Improving the measurement of attitudinal responses: An example from a crime survey', *International Journal of Social Research Methodology,* 2(1): 55-68.

Farrall, S. and Gadd, D., 2004: 'Research note: The frequency of the fear of crime', *The British Journal of Criminology*, 44(1): 127.

Ferraro, K.F. and LaGrange, R., 1987: 'The measurement of fear of crime', *Sociological Review*, 57.

Ferraro, K.F., 1995: *Fear of crime: Interpreting victimisation risk*, State University of New York Press, Albany.

Ferraro, K.F. and LaGrange, R., 2000: 'The measurement of fear of crime', in *The fear of crime* eds. J. Ditton and S. Farrall, Ashgate, Aldershot, pp. 277-308.

Ferraro, K.F. and LaGrange, R.L., 1988: 'Are older people afraid of crime?' *Journal of Aging Studies,* 2(3): 277-287.

Ferraro, K.F. and LaGrange, R.L., 1992: 'Are older people most afraid of crime? Reconsidering age', *Journal of Gerontology,* 47(5): S233.

Fisher, B.S., 1995: 'Fear spots in relation to micro level physical cues: Exploring the overlooked', *Journal of Research in Crime and Delinquency*, 32(2): 214-239.

Fisher, B.S. and Nasar, J.L., 1992: 'Fear of crime in relation to three exterior site features prospect, refuge and escape', *Environment and Behavior,* 24(1): 214-239.

Fisher, S., Allan, A. and Allan, M.M., 2004: 'Exploratory study to examine the impact of television reports of prison escapes on fear of crime, operationalised as state anxiety', *Australian Journal of Psychology*, 56(3): 181-190.

Freundschuh, S, 1998: ‘The relationship between geographic scale, distance, and time as expressed in natural discourse’, in *Spatial and temporal reasoning in Geographic Information Systems*, eds Egenhofer, M.J. and Golledge, R., Oxford University Press, New York, pp. 155-166.

Freeman, K., Jones, C., Weatherburn, D., Rutter, S., Spooner, C., Donnelly. N., 2005: ‘The impact of the Sydney Medically Supervised Injecting Centre (MSIC) on crime’, *Drug and Alcohol Review*, 24(2): 173-184.

Friedberg, A., Andy Research and Forecasts Inc., 1983: *America afraid: How fear of crime changes the way we live*, New American Library Inc, New York.

Furstenberg, F.F.Jr., 1971: 'Public reaction to crime in the streets "the American scholar"', in *The fear of crime* eds. J. Ditton and S. Farrall, Aldershot, Ashgate, pp. 3-12.

Geoscience (GA), 2004: *Place names search results: Kings cross,* Geoscience Australia, Available at: http://www.ga.gov.au/bin/gazm01?placename=kings+cross&placetype=0&state=NSW Accessed: 14/5/04.

Gabriel, U. and Greve, W., 2003: 'The psychology of fear of crime - conceptual and methodological perspectives', *The British Journal of Criminology,* 43(3): 600-614.

Garfinkel, H., 1973: 'Background expectancies', in *Rules and meaning* ed. M. Douglas, Penguin Education, Baltimore, pp. 21.

Garofalo, J., 1979: 'Victimisation and the fear of crime', *Journal of Research in Crime and Delinquency,* 16: 80-97.

Garofalo, J., 1981: 'The fear of crime: Causes and consequences', *Journal of Criminal Law and Criminology,* 72(2):839.

Gibbons, S., 2004: 'The costs of urban property crime', *Economic Journal,* 114(499): 441-463.

Gibson, C.L., Zhao, J.H., Lovrich, N.P. and Gaffney, M.J., 2002: 'Social integration, individual perceptions of collective efficacy, and fear of crime in three cities', *Justice Quarterly,* 19(3): 537-564.

Gilchrist, E., Bannister, J., Ditton, J. and Farrall, S., 1998: 'Women and the 'fear of crime' - challenging the accepted stereotype', *The British Journal of Criminology,* 38(2): 283-298.

Girling, E., Loader, I. and Sparks, R., 2000: *Crime and social change in middle England: Questions of order in an English town,* Routledge, London.

Glensor, R.W. and Peak, K., 1996: 'Implementing change: Community-oriented policing and problem solving', *FBI Law Enforcement Bulletin,* 65(7): 14.

Gold, J.R. and Revill, G., 2003: 'Exploring landscapes of fear: Marginality, spectacle and surveillance', *Capital and Class,* 80): 27.

Gomme, I.M., 1986: 'Fear of crime among Canadians: A multivariate analysis', *Journal of Criminal Justice,* 14:3 (1986): 249.

Grabosky, P.N., 1995: 'Fear of crime, and fear reduction strategies', *Current Issues in Criminal Justice,* 7(1): 7-19.

Gray, D.E. and OÇonner, M.E., 1990: 'Concern about to fear of crime in an Australian rural community', *Australia and New Zealand Journal of Criminology,* 23: 284-298.

Green, G., Gilbertson, J.M. and Grimsley, M.F.J., 2002: 'Fear of crime and health in residential tower blocks - a case study in Liverpool, UK', *European Journal of Public Health,* 12(1): 10-15.

Greene, J., 1999: 'Zero tolerance: A case study of police policies and practices in New York city', *Crime and Delinquency,* 45(2): 171-187.

Grennan, H., 10/5/2001: 'Critical mass', *The Sydney Morning Herald.*

NSW Legislative Assembly Hansard., 2001: *Kings Cross policing,* NSW Legislative Assembly, Sydney.

Hale, C., 1996: ‘Fear of crime: A review of the literature’, *International Review of Victimiology,* 4: 79-150.

Hanson, R.F., Smith, D.W., Kilpatrick, D.G. and Freedy, J.R., 2000: 'Crime-related fears and demographic diversity in Los Angeles county after 1992 civil disturbances', *Journal of Community Psychology,* 28(6): 607-623.

Harcourt, B.E., 1998: 'Reflecting on the subject: A critique of the social influence conception and deterrence, the broken windows theory, and order maintenance policing New York style', *Michigan Law Review,* 97(2): 291-389.

Hatfield, E. and Bandaranaike, S., 2001: The impact of crime: Fear and concern in a regional context, a study of the Townsville-Thuringowa Region, Proceedings from the Conference, The Character, Impact and Prevention of Crime in Regional Australia Conference.

Heath, L. and Gilbert, K., 1996: 'Mass media and fear of crime', *The American Behavioral Scientist,* 39(4): 379.

Hollway, W. and Jefferson, T., 1997: 'The risk society in an age of anxiety: Situating fear of crime', *The British Journal of Sociology*, 48(2): 255.

Hollway, W. and Jefferson, T., 2000: 'The role of anxiety in fear of crime', in *Crime, risk and insecurity*, eds. T. Hope and R. Sparks, Routledge, London.

Hope, T. and Sparks, R., 2000: 'Introduction: Risk, insecurity and the politics of law and order', in *Crime, risk and insecurity*, eds. T. Hope and R. Sparks, Routledge, London.

Horin, A., 27/4/1994: 'Building jails is no solution to crime', *The Sydney Morning Herald*.

Hubbard, P., 2003: 'Fear and loathing at the multiplex: Everyday anxiety in the post-industrial city', *Capital and Class*, 80: 51.

Hunter, A., 1978, 'Symbols of incivility: social disorder and fear of crime in urban neighborhoods', paper presented at the Annual Meeting of the American Society of Criminology, Dallas.

Hunter, L.M., Krannich, R.S. and Smith, M.D., 2002: 'Rural migration, rapid growth, and fear of crime', *Rural Sociology*, 67(1): 71-89.

Husserl, E., 1973: 'The possibility of cognition', in *Rules and meaning*, ed. M. Douglas, Penguin Education, Baltimore, pp. 197.

Innes, M., 2003: 'Signal crimes: Detective work, mass media and constructing collective memory', in *Criminal visions* eds.P. Mason, Willan, Cullompton.

Innes, M., 2004a: 'Signal crimes and signal disorders: Notes on deviance as communicative action', *The British Journal of Sociology*, 55(3): 335-355.

Innes, M., 2004b: 'Reinventing tradition? Reassurance, neighbourhood security and policing', *Criminal Justice*, 4(2): 151-171.

Innes, M., Fielding, N. and Cope, N., 2005: "The appliance of science?' The theory and practice of crime intelligence analysis', *British Journal of Criminology*, 45(1): 39-57.

Innes, M., Fielding, N. and Langan, S., 2002: *Signal crimes and control signals: Towards an evidence based framework for reassurance policing*, University of Surrey, Guildford.

Jacobs, J., 1961: The death and life of great American cities, Vintage Books, New York.

Jeffery, C.R., 1971: *Crime Prevention Through Environmental Design*, Sage, Beverly Hills.

John Howard Society of Alabama (JHSA), 1999: *Fear of crime*, John Howard Society of Alabama, Alabama.

Jochelson, R., 1997: *Crime and place: An analysis of assaults and robberies in inner Sydney*, New South Wales Bureau of Crime Statistics and Research, Sydney.

Jopson, D., 2/6/1995: 'Fear that feeds on violent crime', The Sydney Morning Herald.

Joseph, J., 1997: 'Fear of crime among black elderly', *Journal of Black Studies*, 27(5): 698-717.

Kanan, J.W. and Pruitt, M.V., 2002: 'Modeling fear of crime and perceived victimisation risk: The (in)significance of neighborhood integration', *Sociological Inquiry*, 72(4): 527-548.

Kaplan, S., 1973: 'Cognitive maps in perception and thought'. in *Image and environment.* eds. R. M. Downs and D. Stea, Aldine, Chicago.

Katz, C.M., Webb, V.J. and Armstrong, T.A., 2003: 'Fear of gangs: A test of alternative theoretical models', *Justice Quarterly*, 20(1): 95-130.

Kelling, G.L. and Coles, C.M., 1997: *Fixing broken windows: Restoring order and reducing crime in our communities*, Touchstone, New York.

Kenney, D.J., 1987: *Crime, fear and the New York subways: The role of citizen action*, Prager, New York.

Killias, M., 1990: 'New methodological perspectives for victimisation surveys: The potentials of computer assisted telephone surveys and some related innovations', in *The fear of crime* eds. J. Ditton and S. Farrall, Aldershot, Ashgate, pp. 315-330.

Killias, M. and Clerici, C., 2000: 'Different measures of vulnerability in their relation to different dimensions of fear of crime', *The British Journal of Criminology*, 40(3): 437-450.

KingsCrossOnline, 2004: *Kings Cross*, Kings Cross Partnership Inc. 2004., Available at: http://www.kingscrossonline.com.au/. Accessed: 18/10/05.

Kitchen, T., 2002: 'Crime prevention and the British planning system: New responsibilities and older challenges', *Planning Theory and Practice*, 3:155-172.

Kitchin, R.M., 1996: 'Increasing the integrity of cognitive mapping research: Appraising conceptual schematar of environment-behaviour interaction', *Progress in Human Geography*, 20(1): 56-84.

Knox, M., 19/3/2003: 'Turning point', *The Sydney Morning Herald*.

Koskela, H., 1999: 'Gendered exclusions: Women's fear of violence and changing relations to space', *Geografiska Annaler*, 81B(2): 111-124.

Koskela, H. and Pain, R., 2000: 'Revisiting fear and place: Women's fear of attack and the built environment', *Geoforum*, 31(2): 269-280.

Kovecses, Z., 1990: *Emotion concepts*, Sprnger-Verlag, New York.

Krahn, H. and Kennedy, L.W., 1985: 'Producing personal safety: The effects of crime rates, police force size, and fear of crime', *Criminology*, 23(4): 697-710.

Kuo, F.E. and Sullivan, W.C., 2001: 'Environment and crime in the inner city: Does vegetation reduce crime?' *Environment and Behavior*, 33(3): 343-367.

Kuttschreuter, M. and Wiegman, O., 1998: 'Crime prevention and the attitude toward the criminal justice system: The effects of a multimedia campaign', *Journal of Criminal Justice*, 26(6): 441-452.

Kwan, M.P., 2000: 'Interactive geovisualization of activity-travel patterns using three-dimensional geographical information systems: A methodological exploration with a large data set', *Transportation Research Part C*, 8: 185-203.

LaGrange, R.L. and Ferraro, K.F., 1987: 'The elderly's fear of crime: A critical examination of the research', in *The fear of crime*, eds. J. Ditton and S. Farrall, (2000), Aldershot, Ashgate, pp. 77-96.

LaGrange, R.L. and Ferraro, K.F., 1989: 'Assessing age and gender differences in perceived risk and fear of crime', *Criminology*, 27(4): 697.

Lane, J. and Meeker, J.W., 2000: 'Subcultural diversity and the fear of crime and gangs', *Crime and Delinquency*, 46(4): 497-521.

Lane, J. and Meeker, J.W., 2003: 'Fear of gang the crime: A look at three theoretical models', *Law and Society Review*, 37(2): 425-456.

Lawton, B.A., Taylor, R. and Luongo, A., 2005: 'Police officers on drug corners in Philadelphia, drug crime, and violent crime: Intended, data fusion, and displacement impacts', *Justice quarterly*, 22(4).

Lemanski, C., 2004: 'A new apartheid? The spatial implications of fear of crime in Cape Town, South Africa', *Environment and Urbanization*, 16(2): 101-111.

Lewis, D.A. and Salem, G., 1986: *Fear of crime: Incivility and the production of a social problem*, Transaction Inc., New Brunswick.

Lianos, M.W. and Douglas, M., 2000: 'Dangerization and the end of deviance: The institutional environment', in *Criminology and social theory*, eds. D. Garland and R. Sparks, Oxford University Press, Oxford.

Lindstrom, M., Merlo, J. and Ostergren, P-O., 2003: 'Social capital and sense of insecurity in the neighbourhood: A population-based multilevel analysis in Malmo, Sweden', *Social Science and Medicine*, 56(5): 1111-1120.

Liska, A.E., Sanchirico, A. and Reed, M.D., 1988: 'Fear of crime and constrained behavior specifying and estimating a reciprocal effects model', *Social Forces*, 66(3): 827-838.

Loukaitou-Sideris, A., 1999: 'Hot spots of bus stop crime: The importance of environmental attributes', *Journal of the American Planning Association*, 65(4): 395-412.

Lumby, R., 2005: *Kings Cross*, Kings Cross Partnership Inc., Available at: http://www.kingscrossonline.com.au/page.asp?e_page=371346. Accessed: 18/10/05.

Lupton, D., 1999: 'Dangerous places and the unpredictable stranger: Constructions of fear of crime', Australian and New Zealand Journal of Criminology, 32(1): 1-15.

Lupton, D. and Tulloch, J., 1999: 'Theorizing fear of crime: Beyond the rational/irrational opposition', *The British Journal of Sociology*, 50(3): 507-523.

MacEachren, A.M., Wachowicz, M., Edsall, R., Haug, D. and Masters, R., 1999: 'Constructing knowledge from multivariate spatiotemporal data: Integrating geographical visualization with knowledge discovery in database methods', *International Journal of Geographical Information Science*, 13(4).

Macken, J., 25/7/1998: 'The fearful society takes guard', *The Australian Financial Review*.

Markowitz, F.E., Bellair, P.E., Liska, A.E. and Liu, J., 2001: 'Extending social disorganization theory: Modeling the relationships between cohesion, disorder, and fear', *Criminology*, 39(2): 293.

Martin, D., 1991: *Geographic Information Systems and their socioeconomic applications*, Routledge, London.

Maruna, S., Matravers, A. and King, A., 2004: 'Disowning our shadow: A psychoanalytic approach to understanding punitive public attitudes', *Deviant Behavior*, 25(3): 277-299.

Mawby, R.I., Brunt, P. and Hambly, Z., 2000: 'Fear of crime among British holidaymakers', *The British Journal of Criminology*, 40(3): 468-479.

May, D.C., Vartanian, L.R. and Virgo, K., 2002: 'The impact of parental attachment and supervision on fear of crime among adolescent males', *Adolescence*, 37(146): 267.

Mayhew, P., 1995: ‘Some methodological issues in victimisation surveys’, in *Crime victims surveys in Australia: Conference Proceedings*, ed. Criminal Justice Commission, The Print People, Brisbane.

McDonnell, R. and Kemp, K., 1995: *International GIS dictionary*. GeoInformation International, Cambridge.

McCoy, V.H., J.D., W., Cullen, F.T., Dubeck, P.J. and Browning, S.L., 1996: 'Lifestyles of the old and not so fearful: Life situation and older persons fear of crime', *Journal of criminal justice*, 24(3): 191-205.

McCrea, R., Shyy, T.K., Western, J. and Stimson, R.J., 2005: 'Fear of crime in Brisbane: Individual, social and neighbourhood factors in perspective', Journal of Sociology, 41(1): 7-27.

McKenzie, R.D., 1921: 'The neighbourhood', in *On human ecology*, eds. A.H. Hawley and R.D. McKenzie, University of Chicago press, Chicago.

Meithe, T.D., and Meier, R.F., 1990: ‘Opportunity, choice and criminal victimization: A test of a

theoretical model', *Journal of Research in Crime and delinquency*, 27: 243-266.

Mennis, J.L., 2003: 'Deivation and implementation of a semantic GIS data model informed by principles of cognition', *Computers, Environment and Urban Systems*, 27(5): 455-479.

Merry, S.E., 1981: *Urban danger: Life in a neighbourhood of strangers*, Temple University press, Philadelphia.

Mesch, G.S., 2000: 'Perceptions of risk, lifestyle activities, and fear of crime', *Deviant Behavior*, 21(1): 47-62.

Miceli, R., Roccato, M. and Rosato, R., 2004: 'Fear of crime in Italy - spread and determinants', *Environment and Behavior*, 36(6): 776-789.

Millie, A. and Herrington, V., 2005: 'Bridging the gap: Understanding reassurance policing', *The Howard Journal of Criminal Justice*, 44(1): 41.

Mirrlees-Black, C. and Allen, J., 1998: *Concern about crime: Findings from the 1998 British crime survey*, Home Office Research, Development and Statistics Directorate, London.

Moffatt, S. and Goh, D., 2004: 'New South Wales recorded crime statistics 2003: Regional analysis of crime trends', *Crime and Justice Statistics*, March: 1-11.

Moran, L.J., Skeggs, B., Tyrer, P. and Corteen, K., 2003: 'The formation of fear in gay space: The 'straights' story', *Capital and Class*, 80: 173.

Murray, A.T., McGuffog, I., Western, J.S. and Mullins, P., 2001: 'Exploratory spatial data analysis techniques for examining urban crime', *The British Journal of Criminology*, 41(2): 309-329.

Nair, G., Ditton, J. and Phillips, S., 1993: 'Environmental improvements and the fear of crime: The sad case of the 'pond' area in Glasgow', *The British Journal of Criminology*, 33(4): 555-561.

Nasar, J.L., 1998: *The evaluative image of the city*, Sage, California.

Nasar, J.L., Fisher, B. and Grannis, M., 1993: 'Proximate physical cues to fear of crime', *Landscape and Urban Planning*, 26: 161-178.

Nasar, J.L. and Jones, K.M., 1997: 'Landscapes of fear and stress', *Environment and Behavior*, 29(3): 291-323.

Nelson, A., Bromley, R. and Thomas, C., 2001: 'Identifying micro-spatial and temporal patterns of violent crime and disorder in a British city centre', *Applied Geography*, 21: 249-274.

Newman, O., 1972: *Defensible space: Crime Prevention Through Environmental Design*, Macmillan, New York.

Newman, O., 1976: *Design guidelines for creating defensible space*, National Institute of Law Enforcement and Criminal Justice, Washington.

New South Wales Police Force (NSW Police), 2004: *NSW police annual report 2003-2004*, Executive Support Group and Public Affairs, NSW Police, Sydney.

Oatley, K. and Jenkins, J., 1996: *Understanding emotions*, Blakwell Publishers, Cambridge.

Oc, T. and Tiesdell, S., 1997: *Safer city centres : Reviving the public realm*, Chapman, London.

Oppenheim, A.N., 2001: *Questionanaire design, interviewing and attitude measurement*, Continuum, London.

Orleans, P., 1973: 'Differential cognition of urban residents: effects of social scale on mapping', in *Image and environment*, eds Downs, Roger M. and Stea, David., Edward Arnold, Chicago, pp. 115-130.

Ortega, S.T. and Myles, J.L., 1987: 'Race and gender effects on fear of crime: An interactive model with

age', *Criminology*, 25(1): 133.

Pain, R., 2003: 'Youth, age and the representation of fear', *Capital and Class*, 80: 151.

Pain, R., 2001: 'Gender, race, age and fear in the city', *Urban Studies*, 38(5/6): 899.

Pain, R., 2000: 'Place, social relations and the fear of crime: A review', *Progress in Human Geography*, 24(3): 365-387.

Pain, R., 1991: 'Space, sexual violence and social control: Integrating geographical and feminist analyses of women's fear of crime', *Progress in human geography*, 15(4): 415-431.

Painter, K., 1996: 'The influence of street lighting improvements on crime, fear and pedestrian street use, after dark', *Landscape and Urban Planning*, 35(2-3): 193-201.

Pantazis, C., 2000: ''Fear of crime', vulnerability and poverty', *The British Journal of Criminology*, 40(3): 414-436.

Perkins, R., 1991: *Working girls : Prostitutes, their life and social control*, Australian Institute of Criminology, Canberra.

Perkins, D.D. and Taylor, R.B., 1996: 'Ecological assessments of community disorder: Their relationship to fear of crime and theoretical implications', *American Journal of Community Psychology*, 24(1): 63-107.

Perloff, L.S., 1983: 'Perceptions of vulnerability to victimisation', *Journal of Social Issues*, 39(2): 41-61.

Phillips, T. and Smith, P., 2003: 'Everyday incivility: Towards a benchmark', *Sociological Review*, 51(1): 85-108.

Pollack, L.M., 1980: 'Territoriality and fear of crime in elderly and non-elderly homeowners', *Journal of Social Psychology*, 111(1): 119.

Potas, I. ,1996: 'Courts and sentencing', In *Crime and justice: An Australian textbook in criminology*, Ed., K.M. Hazelhurst, LBC Information Services, North Ryde.

Punch, K., 1998: *Introduction to social research: quantitative and qualitative approaches*, Sage, London.

Rader, N.E., 2004: 'The threat of victimisation: A theoretical reconceptualization of fear of crime', *Sociological Spectrum*, 24(6): 689-704.

Ratcliffe, J.H. and McCullagh, M.J., 2001: 'Chasing ghosts?: Police perception of high crime areas', *The British Journal of Criminology*, 41(2): 330-341.

Reid, L.W. and Konrad, M., 2004: 'The gender gap in fear: Assessing the interactive effects of gender and perceived risk on fear of crime', Sociological Spectrum, 24(4): 399-425.

Reid, L., Roberts, J.T. and Hilliard, H.M., 1998: 'Fear of crime and collective action: An analysis of coping strategies', *Sociological Inquiry*, 68(3): 312-328.

Reiss, A.J., 1986: 'Why are communities important in understanding crime', in *Communities and crime* eds. A.J. Reiss and M. Tonry, University of Chicago press, Chicago, pp. 1-34.

Riger, S., 1978: 'Women's fear of crime: From blaming to restricting the victim', *Victimology*, 3:3/4: 274.

Robinson, J.B., Lawton, B.A., Taylor, R.B. and Perkins, D.D., 2003: 'Multilevel longitudinal impacts of incivilities: Fear of crime, expected safety, and block satisfaction', *Journal of Quantitative Criminology*, 19(3): 237-274.

Robson, C., 1996: *Real world research: A resource for social scientists and practitioner-researchers*, Blackwell, Oxford.

Romer, D., Jamieson, K.H. and Aday, S., 2003: 'Television news and the cultivation of fear of crime', *Journal of Communication*, 53(1): 88-104.

Rondeau, M.B., Brantingham, P.L. and Brantinham, P.L., 2005: 'The value of environmental criminology for the design professions of architecture, urban design, landscape architecture, and planning', *Journal of architectural and planning research,* 22(4): 294-304.

Rose, N., 2000: 'Government and control', in *Criminology and social theory,* eds. D. Garland and R. Sparks, Oxford University Press, Oxford.

Ross, C.E. and Mirowsky, J., 1999: 'Disorder and decay: The concept and measurement of perceived neighborhood disorder', *Urban Affairs Review,* 34(3): 412-433.

Rountree, P.W. and Land, K.C., 1996: 'Perceived risk versus fear of crime: Empirical evidence of conceptually distinct reactions in survey data', *Social Forces,* 74(4): 1353-1377.

Russo, J., 2001: 'From description to prediction: Crime mapping', *TechBeat,* 14.

Sacco, V., F and Glackman, W., 1987: 'Vulnerability, loss of control, and worry about crime', in *The fear of crime,* eds. J. Ditton and S. Farrall, Aldershot, Ashgate, pp. 415-428.

Salmi, S., Gronroos, M. and Keskinen, E., 2004: 'The role of police visibility in fear of crime in Finland', *Policing: An International Journal of Police Strategies and Management,* 27(4): 573-591.

Sampson, R.J., 1986: 'Crime in cities: The effects of formal and informal social control', in *Communities and crime,* eds. A.J. Reiss and M. Tonry, University of Chicago press, Chicago, pp. 271-312.

Sampson, R. and Groves, B., 1989: 'Community structure and crime: Testing social disorganisation theory', *American Journal of sociology,* 94: 774-802.

Sampson, R.J., Raudenbush, S.W., Earls, F., 1997: Neighbourhoods and violent crime: A multilevel study of collective efficacy, *Science,* 277: 918-924.

Sampson, R.J. and Raudenbrush, S.W., 1999: 'Systematic social observation of public spaces: A new look at disorder in urban neighborhoods', *American Journal of Sociology,* 105(3).

Samuels, R. and Judd, B., 2002: *Public housing estate renewal: Interventions and the epidemiology of victimisation,* Proceedings from the Conference, Housing, Crime and Stronger Communities Conference, Melbourne,

Schweitzer, J.H., Kim, J.W. and Mackin, J.R., 1999: 'The impact of the built environment on crime and fear of crime in urban neighborhoods', *Journal of Urban Technology,* 6(3): 59-73.

South Eastern Sydney and Illawarra Area Health Service (SESIAHS), 2005: 'Living history', *Cross Lights Kings Cross Drug and Alcohol Community Focus,* June.

Shaw, C. and McKay, H., 1969: *Juvenile delinquency and urban areas,* University of Chicago Press, Chicago.

Shirlow, P. and Pain, R., 2003: 'The geographies and politics of fear', *Capital and Class,* 80: 15.

Sims, B., Hooper, M. and Peterson, S.A., 2002: 'Determinants of citizens' attitudes toward police: Results of the Harrisburg citizen survey - 1999', *Policing: An International Journal of Police Strategies and Management,* 25(3): 457-471.

Skogan, W.G., 1986: 'Fear of crime and neighbourhood change', in *Communities and crime,* eds. A.J. Reiss and M. Tonry, University of Chicago Press, Chicago, pp. 203-230.

Skogan, W.G., 1990: *Disorder and decline: Crime and the spiral of decay in American neighbourhoods,* University of California Press, Los Angeles.

Skogan, W.G., 1999: 'Measuring what matters: Crime, disorder and fear', in *Measuring what matters: Proceedings from the police research institute meetings,* ed. R.H. Langworthy, National Institute of Justice, Washington DC.

Skogan, W.G., 2004: 'Preface', *Annals of the American Academy*, May: 1-14.

Skogan, W.G. and Klecka, W., 1977: *The fear of crime*, The American Political Science Association, Washington DC.

Skogan, W.G. and Maxfield, M.G., 1981: *Coping with crime : Individual and neighborhood reactions*, Sage Publications, Beverly Hills.

Sluckin, W., 1979: *Fear in animals and man*, New York, Von Nostrand Reinhold.

Smith, L.N. and Hill, G.D., 1991: 'Victimisation and fear of crime', *Criminal Justice and Behaviour*, 18(2): 217-239.

Smith, S.J., 1987: 'Fear of crime: Beyond a geography of deviance', *Progress in Human Geography*, 11: 1-23.

Smith, W.R. and Tortensson, M., 1997: 'Gender differences in risk perception and neutralising fear of crime', *The British Journal of Criminology*, 37(4): 603-634.

Sparks, R., 1992: *Television and the drama of crime: Moral tales and the place of crime in public life*, Open University Press, Buckingham Shire.

Sparks, R., 2000: 'Perspectives on risk and penal politics', in *Crime, risk and insecurity*, eds. T. Hope and R. Sparks, Routledge, London.

Sparks, R., 2001: 'Degrees of estrangement: The cultural theory of risk and comparative penology', *Theoretical Criminology*, 5(2): 159-176.

Sparks, R., Girling, E. and Loader, I., 2001: 'Fear and everyday urban lives', *Urban Studies*, 38(5-6): 885-898.

Spelman, W., 2004: 'Optimal targeting of incivility-reduction strategies', *Journal of Quantitative Criminology*, 20(1): 63-88.

Stafford, M.C. and Galle, O.R., 1984: 'Victimisation rates, exposure to risk, and fear of crime', *Criminology*, 22(2): 173.

Stanko, E.A., 2000: 'Victims R us: The life history of fear of crime and the politicisation of violence', in *Crime, risk and insecurity*, eds. T. Hope and R. Sparks, Routledge, London.

Stephens, D.W., 1999: 'Measuring what matters', in *Measuring what matters: Proceedings from the police research institute meetings*, ed. R.H. Langworthy, National Institute of Justice Office of Community Oriented Policing Services.

Steventon, G., 1996: 'Defensible space: A critical review of the theory and practice of a crime prevention strategy', *Urban Design*, 1(3): 235-245.

Stinchcombe, A.L., 1978. *Theoretical methods in social history*, Academic Press, New York.

Sundeen, R.A., and Mathieu, J.T., (1976), 'The urban elderly: Environments of fear'. In *Crime and the elderly: Challenge and response*. Ed. Goldsmith J. and Goldsmith, S.S., Lexington, MA. Lexigton Books.

Sutherland, E.H. and Cressey, D.R., 1970: *Criminology*, J.B Lippiuncott Company, Philadelphia.

Sun, I.Y., Triplett, R. and Gainey, R.R., 2004: 'Neighbourhood characteristics and crime: A test of Sampson and Groves' model of social disorganisation', *Western Criminology Review*, 5(1).

SydneyOnline, 2005: *Kings Cross*, Sydney Online, Available at: http://www.Sydney.com.au/kingsx.htm. Accessed: 18/10/05.

Taylor, R. and Hale, M., 1986: 'Criminology: Testing alternative models of fear of crime', *Journal of Criminal Law and Criminology*, 77: 151-189.

Taylor, R.B., 1988: *Human territorial functioning: An empirical, evolutionary perspective on individual and small group territorial functioning, behaviours and consequences*, Cambridge University Press, Cambridge.

Taylor, I., 1996: 'Fear of crime, urban fortunes and suburban social movements: Some reflections from Manchester', *Sociology: the Journal of the British Sociological Association*, 30(2): 317.

Taylor, R.B., 1999: 'The incivilities thesis: Theory, measurement, and policy', in *Measuring what matters: Proceedings from the police research institute meetings*, ed. R.H. Langworthy, National Institute of Justice Office of Community Oriented Policing Services.

Taylor, R.B., 2001: *Breaking away from broken windows*, Westview Press, Boulder.

Taylor, R.B., 2002: 'Fear of crime, social ties, and collective efficacy: Maybe masquerading measurement, maybe deja vu all over again', *Justice Quarterly*, 19(4): 773-792.

Taylor, R.B. and Covington, J., 1993: 'Community structural change and fear of crime', *Social Problems*, 40(3): 374-395.

Taylor, R.B. and Gottfredson, S.D., 1986: 'Environmental design, crime and prevention: An examination of community dynamics', in *Communities and crime* eds. A.J. Reiss and M. Tonry, University of Chicago press, Chicago, pp. 387-416.

Taylor, R.B., Gottfredson, S.D. and Brower, S., 1984: 'Block crime and fear: Defensible space, local and social ties and territorial functioning', in *The fear of crime*, eds. J. Ditton and S. Farrall, Aldershot, Ashgate, pp. 429-458.

Tewksbury, R. and Mustaine, E.E., 2003: 'College students' lifestyles and self-protective behaviors: Further considerations of the guardianship concept in routine activity theory', *Criminal Justice and Behavior*, 30(3): 302-327.

Thompson, C.Y., Bankston, W.B., and Pierre, R.L., 1992: ‘Parity and disparity among three measures of fear of crime: A research note’, *Deviant Behaviour: An Interdisciplinary Journal*, 13: 373-389.

Thompson, E.E. and Krause, N., 1998: 'Living alone and neighborhood characteristics as predictors of social support in late life', *Journals of Gerontology Series B-Psychological Sciences and Social Sciences*, 53(6): S354-S364.

Toseland, R.W., 1982: 'Fear of crime: Who is most vulnerable?' *Journal of Criminal Justice*, 10:3 (1982): 199.

Totaro, P., 24/10/1988: 'Sydney plays it safe by staying at home', *The Sydney Morning Herald*.

Tourism NSW, 2005: *Kings Cross region*, Tourism NSW, Available at: http://kingscross.visitnsw.com/HolidayLocation/TNSW500148CR.htm. Accessed: 18/10/05.

Travel Online Australia, 2005: *Kings Cross region*, Travel Online Australia, Available at: http://www.Sydney.visitorsbureau.com.au/page2-04.html. Accessed: 18/10/05.

Tulloch, M.I., 2004: 'Parental fear of crime - a discursive analysis', *Journal of Sociology*, 40(4): 362-377.

Tulloch, M.I., 2003: 'Combining classificatory and discursive methods: Consistency and variability in responses to the threat of crime.' *The British Journal of Social Psychology*, 42: 461-476.

Tulloch, M., 2000: 'The meaning of age differences in the fear of crime', *The British Journal of Criminology*, 40(3): 451-467.

Tulloch, J. and Lupton, D., 2003: *Risk and everyday life*, Sage, London.

Tulloch, J., Lupton, D., Blood, W., Tulloch, M., Jennett, C. and Enders, M., 1998: *Fear of crime, Volume One*, Centre for Cross Cultural Research, Canberra.

Tulloch, J., Lupton, D., Blood, W., Tulloch, M., Jennett, C. and Enders, M., 1998: *Fear of crime, Volume Two,* Centre for Cross Cultural Research, Canberra.

Tversky, B. and Taylor, H.A., 1998: 'Acquiring spatial and temporal knowledge from language', in *Spatial and temporal reasoning in Geographic Information Systems*, eds. Egenhofer, M.J. and Golledge, R., Oxford University Press, New York, pp. 155-166.

UBD, 2003: *Sydney Street Directory*, Universal Publishers Pty Ltd, Sydney.

Vacha, E.F. and McLaughlin, T.F., 2004: 'Risky firearms behavior in low-income families of elementary school children: The impact of poverty, fear of crime, and crime victimization on keeping and storing firearms', *Journal of Family Violence,* 19(3): 175.

Valentine, G., 1989: 'The geography of women's fear', *Area,* 21(4): 385-390.

Van Beek, I., 2004: *Some facts about the Sydney Medically Supervised Injecting Centre,* Sydney Medically Supervised Injecting Centre, Available at: http://www.sydneymsic.com/studentsretional.htm. Accessed: 13/9/06.

Vaughan, D., 2002: 'Signals and interpretive work: The role of culture in a theory of practical action', in *Culture in mind: Toward a sociology of culture and cognition.* ed. K. Cerulo, Routledge, New York.

Vold, G.B., Berbard, T.J. and Snipes, J.B., 2002: *Theoretical criminology, fifth addition,* Oxford University press, Oxford.

Wagner, A.E., 1997: 'A study of traffic pattern modifications in an urban crime prevention program', *Journal of Criminal Justice,* 25(1): 19-30.

Walker, M.A., 1994: 'Measuring concern about crime', *The British Journal of Criminology*, 34(3): 366-702.

Walklate, S., 1998: 'Crime and community: Fear or trust?' *The British Journal of Sociology,* 49(4): 550-569.

Walklate, S., 2000: 'Trust and the problem of community in the inner-city', in *Crime, risk and insecurity* eds. T. Hope and R. Sparks, Routledge, London.

Walsh, D. and Poole, A., 1983: *A dictionary of criminology*, Routledge and Kegan Paul, London.

Warr, M., 1984: 'Fear of victimisation: Why are women and the elderly more afraid', *Social Science Quarterly,* 63(3): 681-702.

Warr, M., 1985: 'Fear of rape among urban women', *Social Problems,* 32(3): 238-250.

Warr, M., 2000: 'Fear of crime in the United States: Avenues for research and policy', *Criminal Justice,* 4: 452-489.

Warr, M. and Ellison, C.G., 2000: 'Rethinking social reactions to crime: Personal and altruistic fear in family households', *American Journal of Sociology,* 106(3): 551-578.

Weisburd, D. and Eck, J.E., 2004: 'What can police do to reduce crime, disorder, and fear?' *Annals of the American Academy of Political and Social Science,* 593: 42-65.

Weisburd, D., Wycoff, L.A., Ready, J., Eck, J.E., Hinkle, D.E. and Gajewski, F., 2004: *Does crime just move around the corner?,* US Department of Justice.

Weitzer, R. and Kubrin, C.E., 2004: 'Breaking news: How local TV news and real-world conditions affect fear of crime', *Justice Quarterly,* 21(3): 497-520.

Whitaker, A.M., 2002: *Pictorial history: South Sydney,* Kingsdear Books, Alexandria.

White, R. and Haines, F., 2004: *Crime and criminology*, Oxford University Press, Oxford.

Will, J.A. and McGrath, J.H., 1995: 'Crime, neighborhood perceptions, and the underclass: The relationship between fear of crime and class position', *Journal of Criminal Justice*, 23(2): 163.

Willem Winkell, F., 1998: 'Fear of crime and criminal victimisation: Testing a theory of psychological incapacitation of the 'stressor' based on downward comparison processes', *The British Journal of Criminology*, 38(3): 473.

Williams, J.S., Singh, B.K. and Singh, B.B., 1994: 'Urban youth, fear of crime, and resulting defensive actions', *Adolescence*, 29(114): 323.

Williams, P. and Dickinson, J., 1993: 'Fear of crime: Read all about it. The relationship between newspaper crime reporting and fear of crime', *The British Journal of Criminology*, 33(1): 33-56.

Wilson, J., 1968: ‘The urban unease: Community versus the city’, *The Public Interest*, 12: 25-39.

Wilson, J.Q. and Kelling, G.L., 1982: 'The police and neighbourhood safety: Broken windows', *The Atlantic Monthly*, March: 29-38.

Winkel, F.W., 1998: 'Fear of crime and criminal victimisation: Testing a theory of psychological incapacitation of the 'stressor' based on downward comparison processes', *The British Journal of Criminology*, 38(3): 473-484.

Wood, T.H.J.J., 1997: *Royal commission into the New South Wales Police Service: Volume 1, Corruption*, The Government of the State of New South Wales, Sydney.

Wurff, A.V.D., Stinger, P. and Timmer, F., 1988: Feelings of unsafety in residential surroundings’, in *Environmental social psychology*. Ed. D. Canter, C. Jesuino, L. Soczka, and G. Stephenson, Kluwer, The Hague.

Xu, Y., Fielder, M. and Flaming, K., 2005: 'Discovering the impact of community policing: The broken windows thesis, collective efficacy and citizen's judgment', *Journal of Research in Crime and Delinquency*, 42(2): 147-186.

Yarwood, R., 2001: 'Crime and policing in the British countryside: Some agendas for contemporary geographical research', *Sociologia Ruralis*, 41(2): 201-219.

Yin, P.P., 1980: 'Fear of crime among the elderly: Some issues and suggestions', *Social Problems*, 27: 492.

Yokohari, M., Amemiya, M. and Amati, M., 2004: 'The history and future directions of greenways in Japanese new towns', *Landscape and Urban Planning.*

Zadel, S., 30/3/1989: 'Police hope to stem the Kings Cross crime rate', *The Sydney Morning Herald*.

14. Appendix A: Supplementary methods

This appendix includes supplementary information for the methods chapter. This supplementary information is presented under the same section headings used in the methods chapters.

14.1. The interviewing procedure

Included under the 'The interviewing procedure' heading is:

- the interviewer 'consent form' (page 314),
- a map of the Kings Cross showing primary interviewing sites (page 315),
- the information flyer distributed prior to interviewing, and a map of the Kings Cross LAC where it was distributed (pages 316 and 317), and
- the information sheet provided to the interview respondents (page 318).

14.2. The survey

Included under the 'The survey' heading is the survey used for data collection, (from pages 319). Each survey was printed on double-sided white A4 paper. In order to enable display in this thesis, the survey has been reduced in size. This process has caused a reduction in the quality of the text in the reproduction. Thus, the text was clearer and larger in the original surveys.

Consent to Participate
in the Kings Cross Police / Australian National University
Fear of Crime Mapping Project

I agree to take part in the Fear of Crime Mapping Project conducted by the Kings Cross Police and Melissa Burgess, a researcher from the Australian National University. I understand that my role will involve interviewing the general public on the streets of Kings Cross.

I will be recording and handling statistical information that will become the property of the Kings Cross Police and the principal researcher, Melissa Burgess from the Australian National University and is not to be used by other parties without prior consent. The information must be kept confidential, as far as the law allows. To my knowledge, the information will be true and correct.

I must gain informed consent from the survey respondents that I will be interviewing*. I agree to show respect, beneficence and justice when interviewing survey respondents**.

I hereby acknowledge and consent to the above conditions.

Name (please print):……..

Signed:……. Date:……..

* Under Section 1.7 to 1.11 of the *National Statement on Ethical Conduct in Research Involving Humans* (1999).
** Under Section 1.1 to 1.6 of the *National Statement on Ethical Conduct in Research Involving Humans* (1999).

Figure 96. The interviewer 'consent form'.

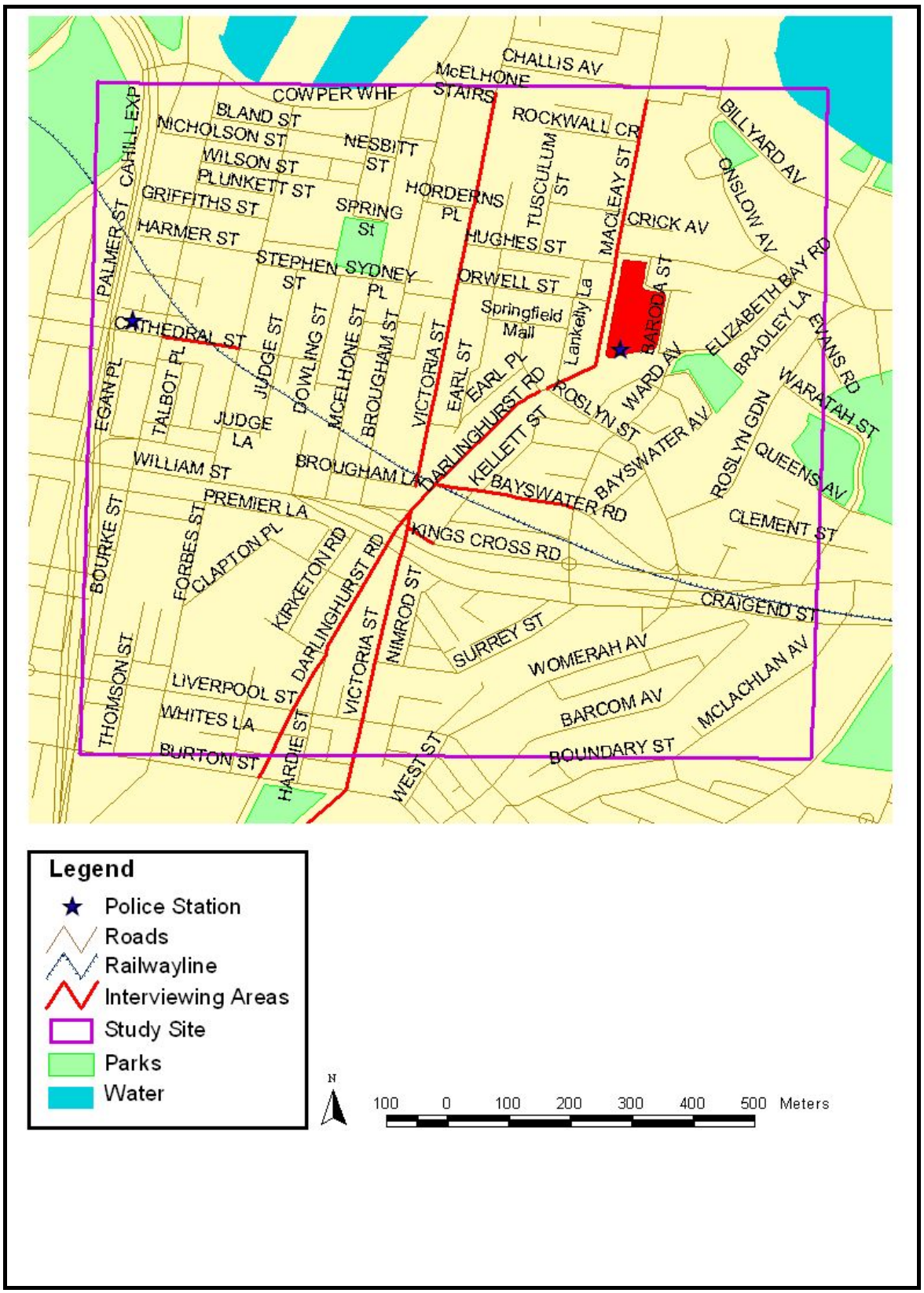


Figure 97. Map of the Kings Cross study site, highlighting the main areas where interviewing took place.

1. Community Safety

THE AUSTRALIAN NATIONAL UNIVERSITY

During April and May 2004 you may be asked to participate in a Fear of Crime Survey. PLEASE DO SO.

What is the survey for?

- The survey will provide information that will be used to investigate the fear of crime in Kings Cross.
- Evidence has shown that people are afraid in areas where there is no crime.
- The information you provide in the survey will help show where members of the community are afraid, and why they feel afraid.
- This is important to know because fear can have negative impacts on you, as individuals, and on the wider community (economically, socially and physically).
- The research will help the Police, the Local Council, businesses and other interested parties tackle those issues that make you feel unsafe and afraid.

What will you have to do?

- Answer a survey that takes approximately 5 minutes.

Will you be identifiable?

- NO, this survey is anonymous.
- The information from the survey will be entered into a database, which will be protected with encryption software. The surveys will then be destroyed. The information you provide will be kept confidential, as far as the law allows.
- The results from the research will be published in a general, grouped manner so it is impossible you can be identified from your answers. For example, results might include statements like: “residents avoid smaller areas than visitors”.

Who will have access to the information?

- The Police Service of New South Wales and Melissa Burgess, the principal researcher, from the Australian National University.

Figure 98. The information flyer.

The information flyer was printed on bright yellow A5 paper.

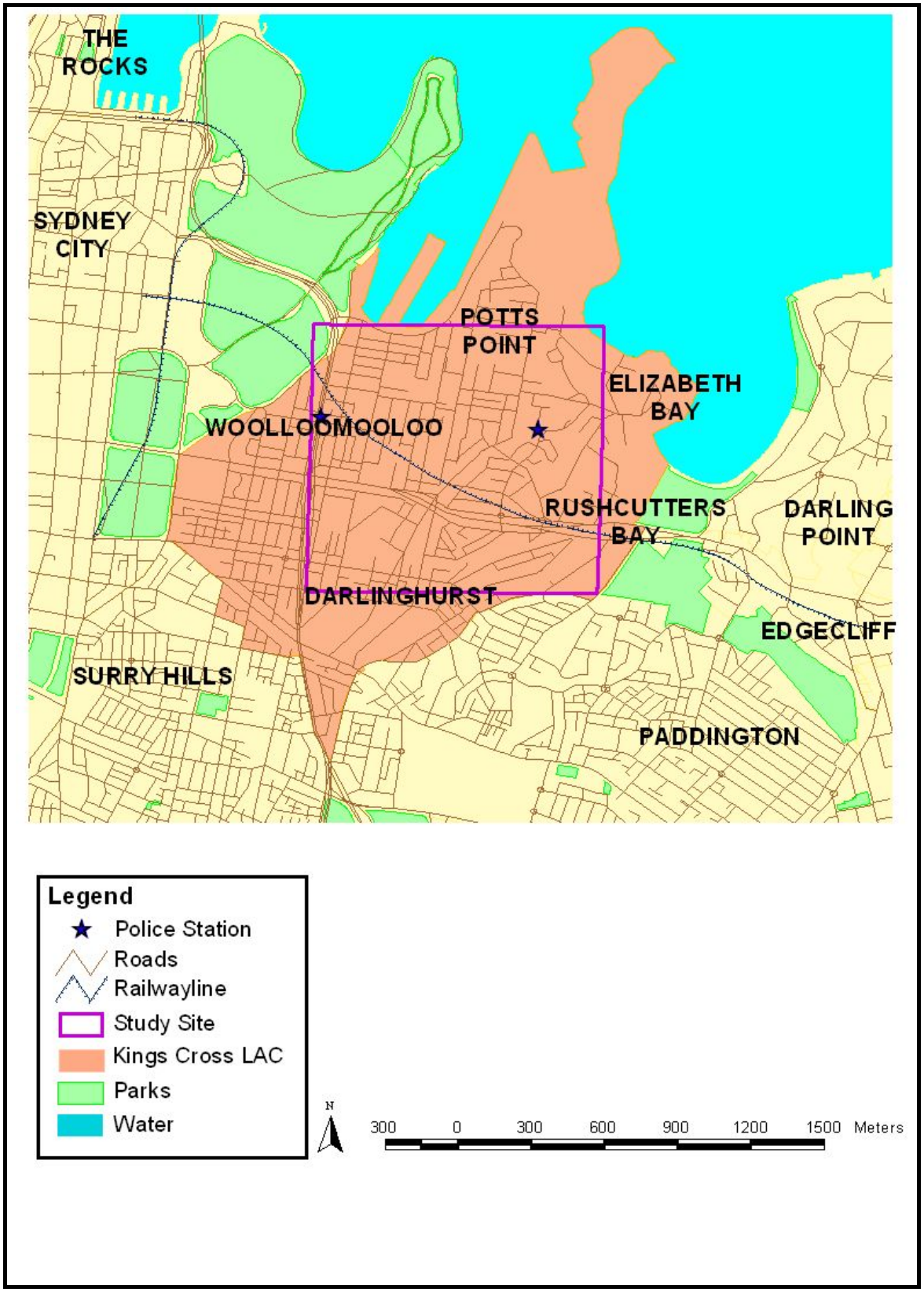


Figure 99. Map of the Kings Cross Police Command, where the information flyers were distributed.

Community Safety Survey

THE AUSTRALIAN NATIONAL UNIVERSITY
School of Resources, Environment and Society
Canberra ACT 0200 Australia
T: +61 2 6125 6211
E: u4020475@anu.edu.au

Who is conducting the research?

- Melissa Burgess, an honours student in the Australian National University's School of Resources, Environment and Society.
- The research will involve a partnership between the ANU and the Police Service of NSW.
- The NSW Police Project Sponsor is David Darcy, Commander Kings Cross Police.

What is the research for?

- The purpose of this research is to investigate the fear of crime in Kings Cross.
- Evidence has shown that people are afraid in areas where there is no crime.
- The information you provide in the survey will help show where members of the community are afraid, and why they feel afraid.
- This is important to know because fear can have negative impacts on you, as individuals, and on the wider community (economically, socially and physically).
- The research will help the Police, the Local Council, businesses and other interested parties tackle those issues that make people feel unsafe and afraid.

Who will have access to the information?

- Melissa Burgess, the principle researcher, and the Police Service of NSW.

Will I be identifiable?

- NO, this survey is anonymous.
- The information from the survey will be entered into a database, which will be protected with encryption software. The surveys will then be destroyed.
- The information you provide will be kept confidential, as far as the law allows.
- The results from the research will be published in a general, grouped manner so it is impossible you can be identified from your answers. For example, results might include statements like: "residents avoid smaller areas than visitors".

What do I have to do?

- Answer a survey that takes approximately 5 minutes.
- Understand that you can withdraw from the survey at any time.

Who can I contact for further information?

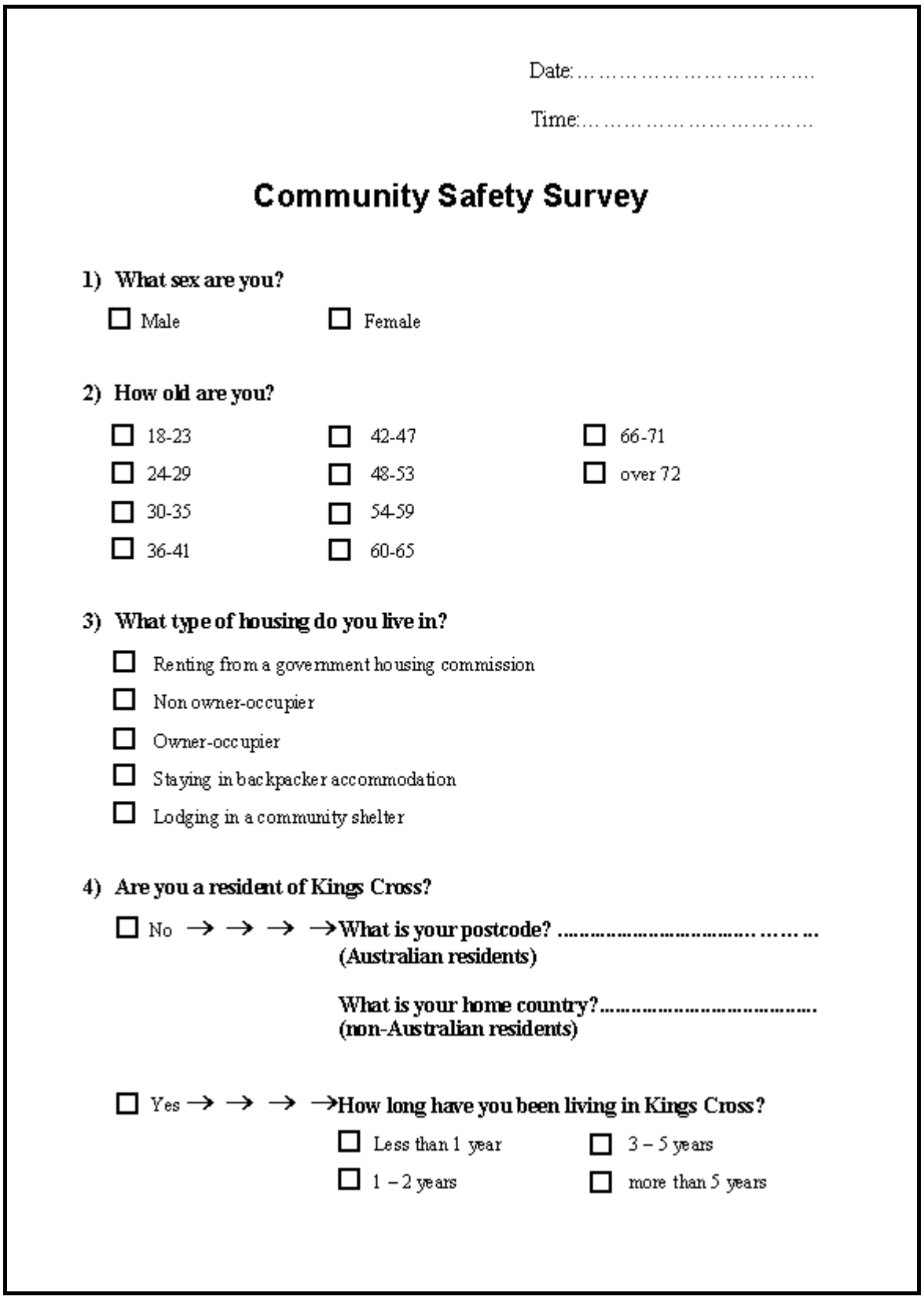
- Melissa Burgess on the above address.

What if I have any ethical concerns?

- Contact the:
  Secretary (Human Ethics Officer)
  Human Research Ethics Committee
  Research Office
  Chancelry 10B
  The Australian National University
  ACT 0200
  Telephone: 02-6125-2900
  Email: Human.Ethics.Officer@anu.edu.au

Figure 100. The information handout.

The information handout was printed on white A4 paper. In order to enable display in this thesis, the handout has been reduced in size. This process has caused a reduction in the quality of the text in the reproduction. Thus, the text was clearer and larger in the original copies.



Date: ……

Time: ……

Community Safety Survey

1) What sex are you?

☐ Male ☐ Female

2) How old are you?

☐ 18-23 ☐ 24-29 ☐ 30-35 ☐ 36-41 ☐ 42-47 ☐ 48-53 ☐ 54-59 ☐ 60-65 ☐ 66-71 ☐ over 72

3) What type of housing do you live in?

☐ Renting from a government housing commission
☐ Non owner-occupier
☐ Owner-occupier
☐ Staying in backpacker accommodation
☐ Lodging in a community shelter

4) Are you a resident of Kings Cross?

☐ No → → → → **What is your postcode? ……**
(Australian residents)

What is your home country?……
(non-Australian residents)

☐ Yes → → → → **How long have you been living in Kings Cross?**

☐ Less than 1 year ☐ 1 – 2 years ☐ 3 – 5 years ☐ more than 5 years

Figure 101a. Page 1 of the survey.

1) Have you been a victim of any of the following crimes in the past 12 months?

- ☐ Deliberate use of a weapon
- ☐ Attack or assault
- ☐ Threats of force or violence
- ☐ Theft and attempted theft
- ☐ Deliberate damage to property or tampering by vandals or thieves

2) If you have been a victim of crime in Kings Cross, did you report it to the Police?

☐ Yes ☐ No

3) Suppose you saw someone in Kings Cross being assaulted or robbed. Do you think you or any of your neighbours would call the police?

☐ Yes ☐ No

4) How confident would you be about obtaining police assistance in a crime-related emergency?

- ☐ Very confident
- ☐ Quite confident
- ☐ Don't know
- ☐ Not very confident
- ☐ Not confident at all

5) Have you ever felt fearful or afraid when walking in Kings Cross?

☐ Yes ☐ No

11) Do you avoid any areas shown on this map of Kings Cross, because you are afraid of being robbed, beaten or attacked

a) **During the day?** If so, please specify which areas on the following map.

b) **After dark?** If so, please specify which areas on the following map.

Figure 127b. Page 2 of the survey.

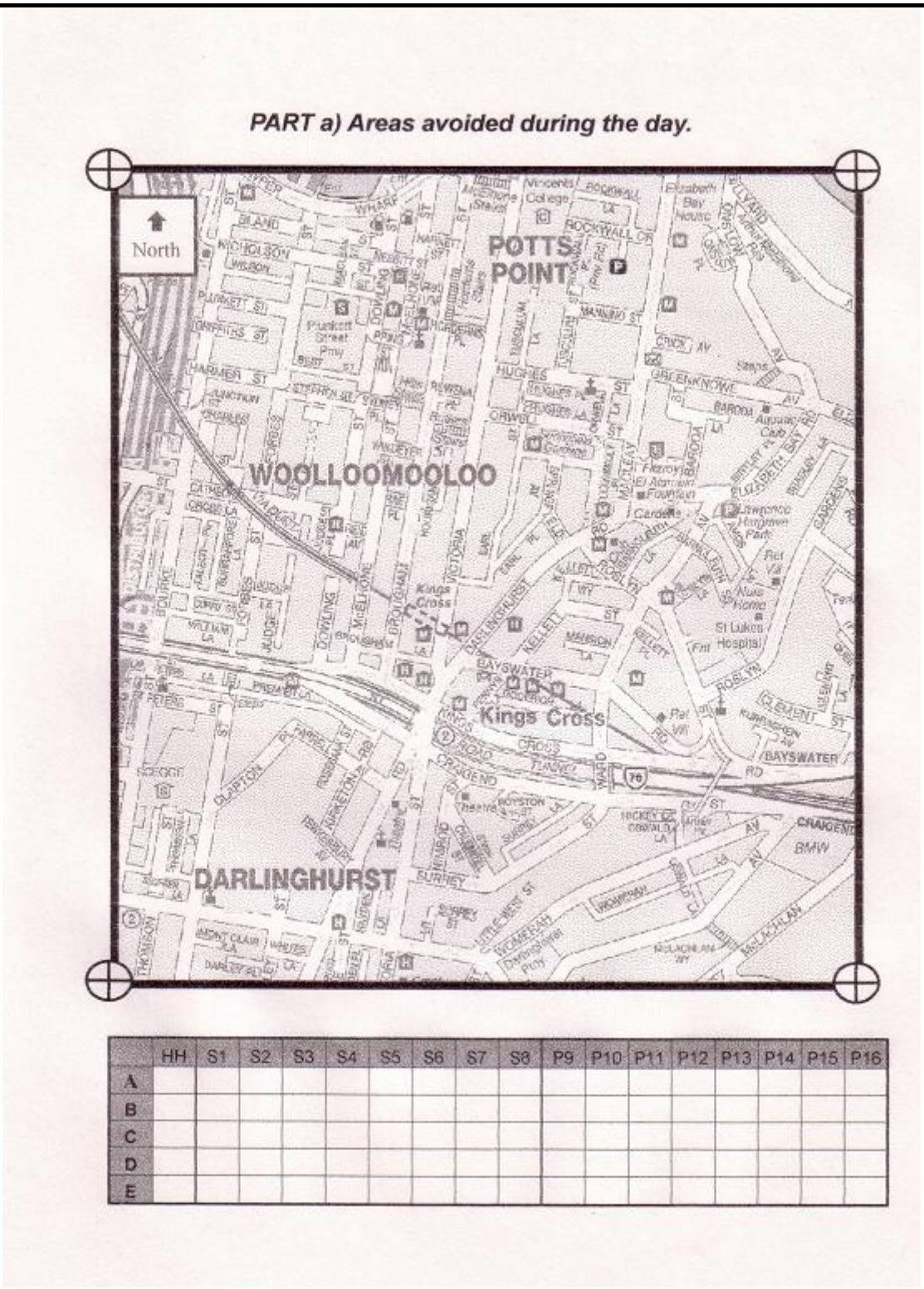
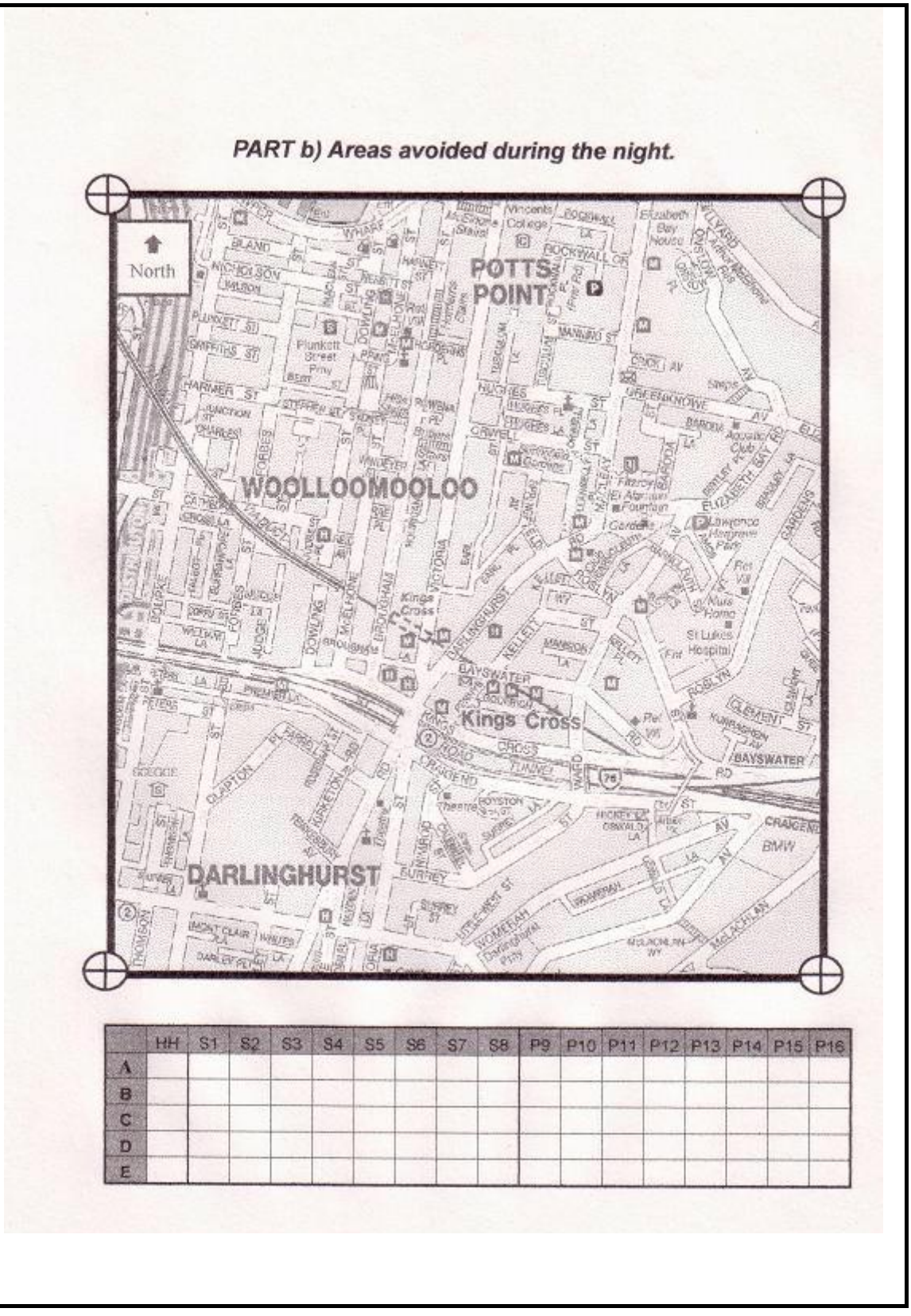


Figure 127c. Page 3 of the survey.



	HH	S1	S2	S3	S4	S5	S6	S7	S8	P9	P10	P11	P12	P13	P14	P15	P16
A																	
B																	
C																	
D																	
E																	

Figure 127d. Page 4 of the survey.

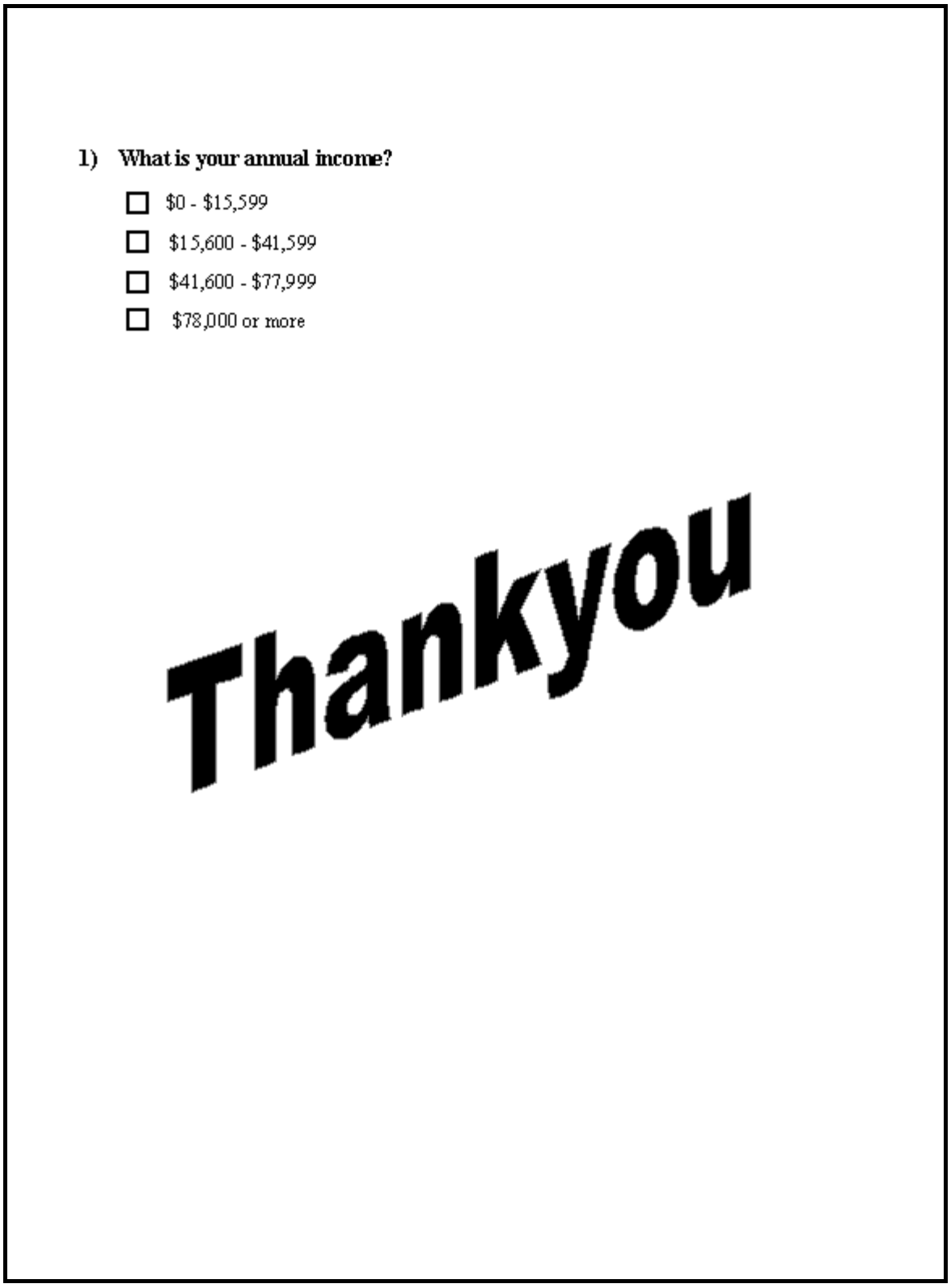


Figure 127e. Page 5 of the survey.

14.3. Fear mapping methods

This section provides more detailed information on some of the methods used to produce the 2d and 3D fear maps.

14.3.1. The rasterisation process

The Arc Macro Language scripts (AMLs) used in the rasterisation process are several pages long. An example from the AML is:

```
/* Arc
/* &aml D:\GIS_Data\Grids\Day\con1.txt
/* &stat 9999
/* &wo D:\GIS_Data\Grids\Day\
/* &r D:\GIS_Data\Grids\Day\con1.txt
grid
verify on
setwindow atemplate
setcell atemplate
kx18d_grd = shapegrid(kx18d_poly.shp, HH, #)
```

The AML used to perform the grid value conversions is several pages long. An example from the AML is:

```
/* Arc
/* &aml D:\GIS_Data\Grids\Day
/* &stat 9999
/* &wo D:\GIS_Data\Grids\Day
/* &r D:\GIS_Data\Grids\Day\day_conversion2.txt
grid
verify on
setwindow atemplate
setcell atemplate
kx3d_grd2 = con(isnull (kx3d_grd), 0, kx3d_grd)
```

14.3.2. The projecting process

The AML used in the projecting process is several pages long. An example from the AML is:

```
/* Arc
/* &aml D:\GIS_Data\Grids2\Day
/* &stat 9999
/* &wo D:\GIS_Data\Grids2\Day
/* &r D:\GIS_Data\Grids2\Day\day_conversion3.txt
PROJECTCOPY GRID D:\GIS_Data\Grids2\Day\atemplate GRID
D:\GIS_Data\Grids2\Day\kx3d_grd2
```

14.3.3. Adding the individual grids to produce accumulative maps

The AML used in to combine all of the individual grids is several pages long. An example, from the collective avoidance AML for *junkies* by female respondents during the day, is:

```
/* &aml D:\GIS_Data\Grids4\Day
/* &stat 9999
/* &wo D:\GIS_Data\Grids4\Day
/* &r D:\GIS_Data\Grids4\Day\day_all_pop2.txt
grid
verify on
S1_d_fem_popa =
        KX9d_grd4 + KX19d_grd4 + KX23d_grd4 + KX34d_grd4 + KX45d_grd4 +
    KX50d_grd4 + KX66d_grd4 + KX74d_grd4 + KX75d_grd4 + KX82d_grd4 +
    KX83d_grd4 + KX84d_grd4 + KX94d_grd4 + KX101d_grd4 + KX106d_grd4 +
    KX112d_grd4 + KX114d_grd4 + KX134d_grd4 + KX136d_grd4 +
    KX137d_grd4 + KX139d_grd4 + KX145d_grd4 + KX146d_grd4 +
        KX148d_grd4 + KX161d_grd4 + KX174d_grd4
S1_d_fem_popb =
        KX178d_grd4 + KX180d_grd4 + KX184d_grd4 + KX194d_grd4 + KX199d_grd4
    + KX210d_grd4 + KX246d_grd4 + KX248d_grd4 + KX249d_grd4 + KX252d_grd4 +
    KX254d_grd4 + KX260d_grd4 + KX263d_grd4 + KX281d_grd4 + Kx336d_grd4 +
    Kx348d_grd4 + Kx351d_grd4 + Kx361d_grd4 + Kx364d_grd4 + Kx372d_grd4 +
    Kx395d_grd4
 S1_d_fem_pop = S1_d_fem_popa + S1_d_fem_popb
```

Another example, from the collective weights AML for *junkies* by female respondents during the day, is:

```
/* &aml D:\GIS_Data\Grids4\Day
/* &stat 9999
/* &wo D:\GIS_Data\Grids4\Day
/* &r D:\GIS_Data\Grids4\Day\demog_day_pop.txt
grid
verify on
S1_d_fem_w06a =
        KX9d_grdah + KX19d_grdah + KX23d_grdah + KX34d_grdah +
        KX45d_grdah + KX50d_grdah + KX66d_grdah + KX74d_grdah +
    KX75d_grdah + KX82d_grdah + KX83d_grdah + KX84d_grdah +
    KX94d_grdah + KX101d_grdah + KX106d_grdah + KX112d_grdah +
    KX114d_grdah + KX134d_grdah + KX136d_grdah + KX137d_grdah +
    KX139d_grdah + KX145d_grdah + KX146d_grdah + KX148d_grdah +
    KX161d_grdah + KX174d_grdah
S1_d_fem_w06b =
        KX178d_grdah + KX180d_grdah + KX184d_grdah + KX194d_grdah +
    KX199d_grdah + KX210d_grdah + KX246d_grdah + KX248d_grdah +
    KX249d_grdah + KX252d_grdah + KX254d_grdah + KX260d_grdah +
    KX263d_grdah + KX281d_grdah + Kx336d_grdah + Kx348d_grdah +
    Kx351d_grdah + Kx361d_grdah + Kx364d_grdah + Kx372d_grdah +
    Kx395d_grdah
S1_d_fem_w06 = S1_d_fem_w06a + S1_d_fem_w06b
```

Another AML example, used to produce the final ‘avoidance hardness’ map for *junkies* by female respondents during the day, is:

```
/* &aml D:\GIS_Data\Grids4\Day
/* &stat 9999
/* &wo D:\GIS_Data\Grids4\Day
/* &r D:\GIS_Data\Grids4\Day\demog_day_weight.txt
grid
verify on
S1_d_fem_AH = S1_d_fem_w06 div S1_d_fem_pop
```

14.3.4. View, scene and layer settings on the 3D fear maps

The following scene, view and layer settings were used to display the 3D fear maps in ArcScene.

14.3.4.1. View settings

	Observer	Target
x	151.22	151.22
y	-33.92	-33.88
z	0.01	-0.01

View angle: 22

Roll angle: 33

14.3.4.2. Scene settings

Azimuth: 20

Altitude: 40

Contrast: 100

14.3.4.3. Layer settings

Rendering: On

Rendering factor 10 for raster layer

15. Appendix B: Supplementary results

This appendix provides supplementary results not displayed in the results chapters. Specifically, it presents the 2D 'avoidance density' and 'avoidance hardness' maps for the 14 environmental cues not displayed in the second results chapter. It therefore excludes the maps for drug users and sex workers. Like in the second results chapter, three different 'avoidance density' maps are displayed, each using a different method to classify and visualise the avoidance density data.

15.1. Avoidance density maps showing percentage of avoiding respondents

The results from the first method to classify the avoidance density data are shown here. These 'avoidance density' maps show the percentage of respondents that avoided each area of the study site (because each environmental cue triggered their fear of crime). The percentage is taken from the total number of avoiding respondents during the day (138) and night (252). These maps were used to create the population percentile bands for the 3D fear maps.

Figure 102. Areas where the survey respondents stated that the presence of SPRUIKERS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 103. Areas where the survey respondents stated that the presence of HOMELESS people triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

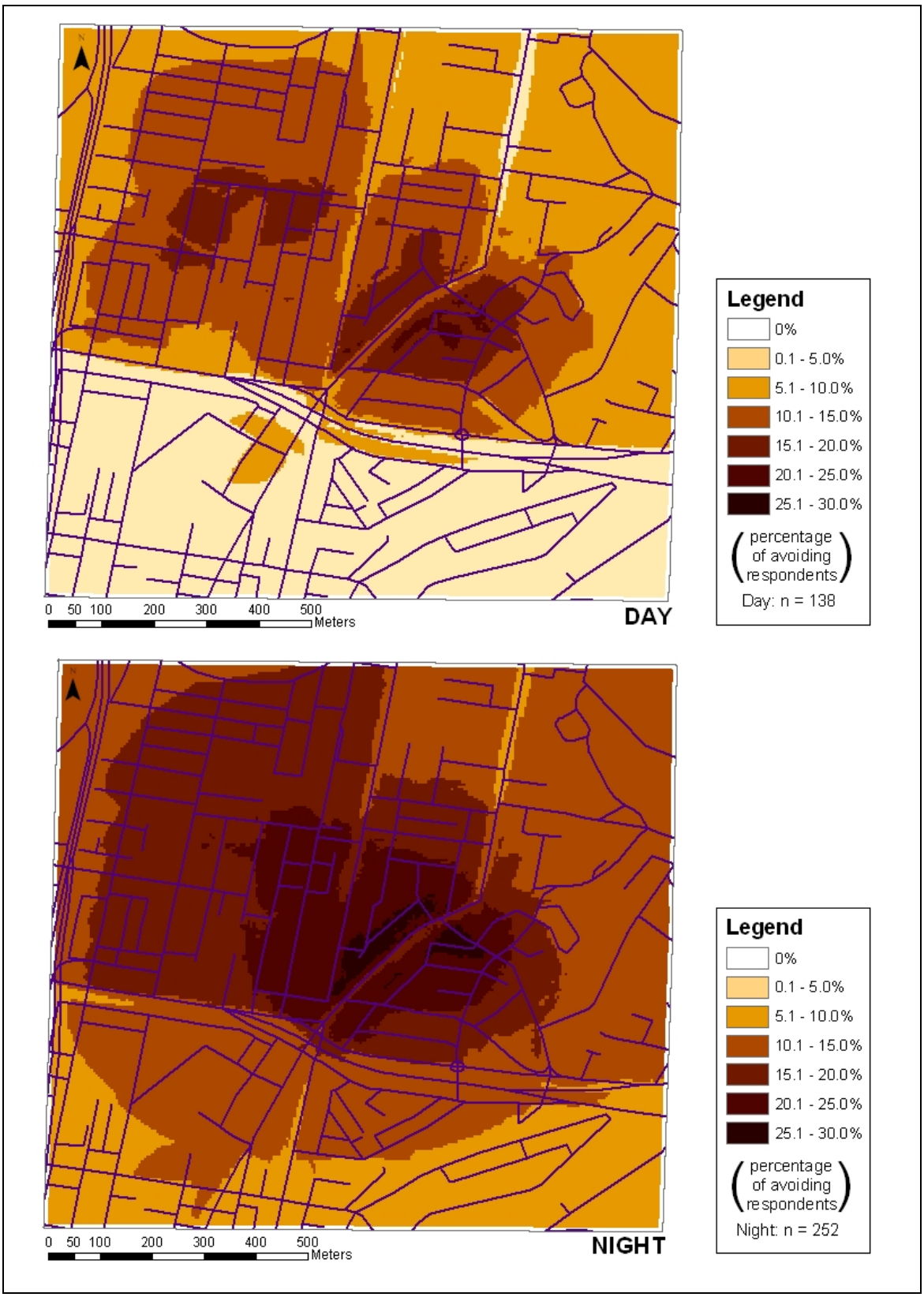


Figure 104. Areas where the survey respondents stated that the presence of INTOXICATED PERSONS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

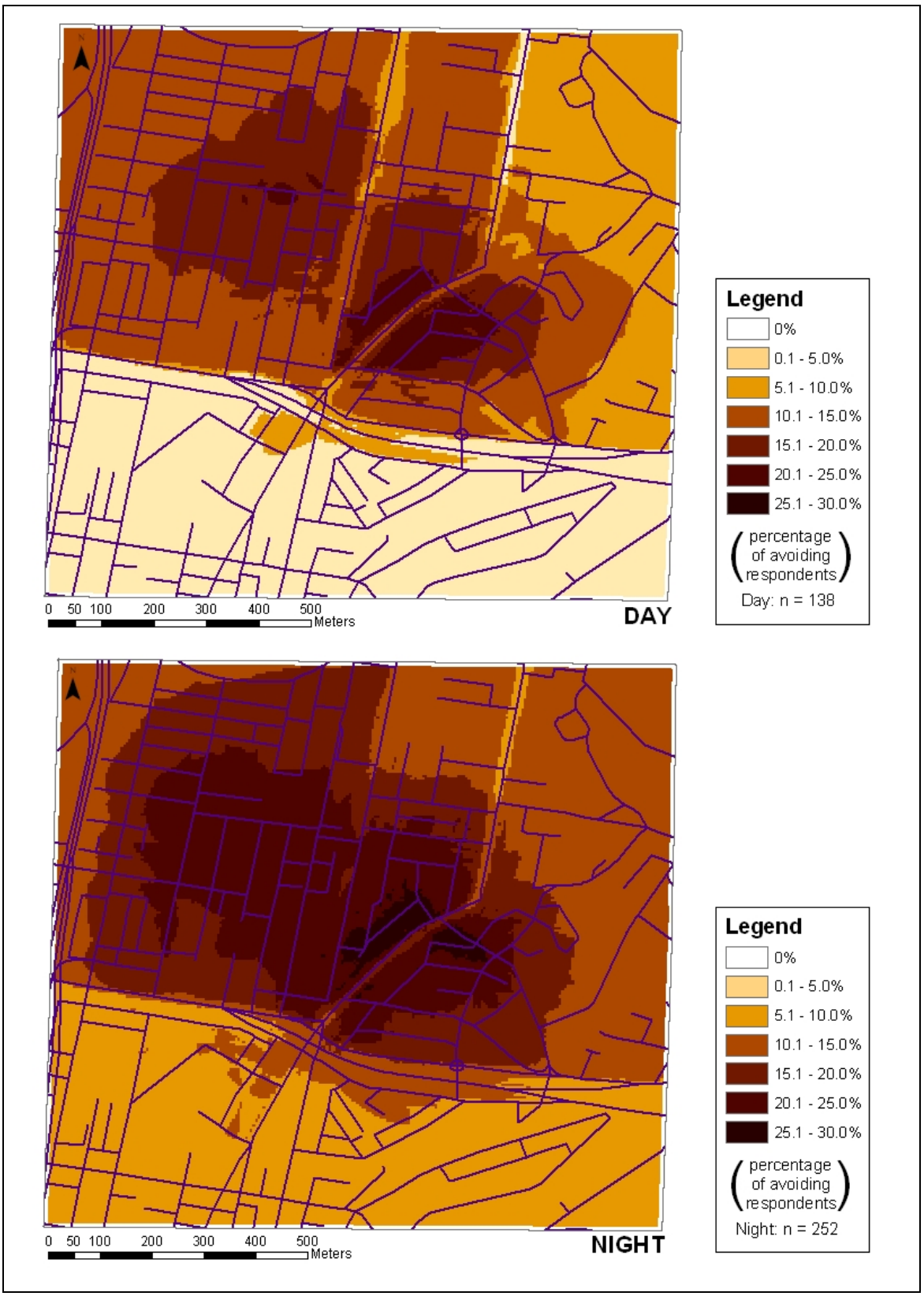


Figure 105. Areas where the survey respondents stated that the presence of GANGS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 106. Areas where the survey respondents stated that the presence of LOITERING PEOPLE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 107. Areas where the survey respondents stated PEDESTRIAN ABSENCE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 108. Areas where the survey respondents stated POOR STREET LIGHTING triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 109. Areas where the survey respondents stated that the presence of VANDALISM triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

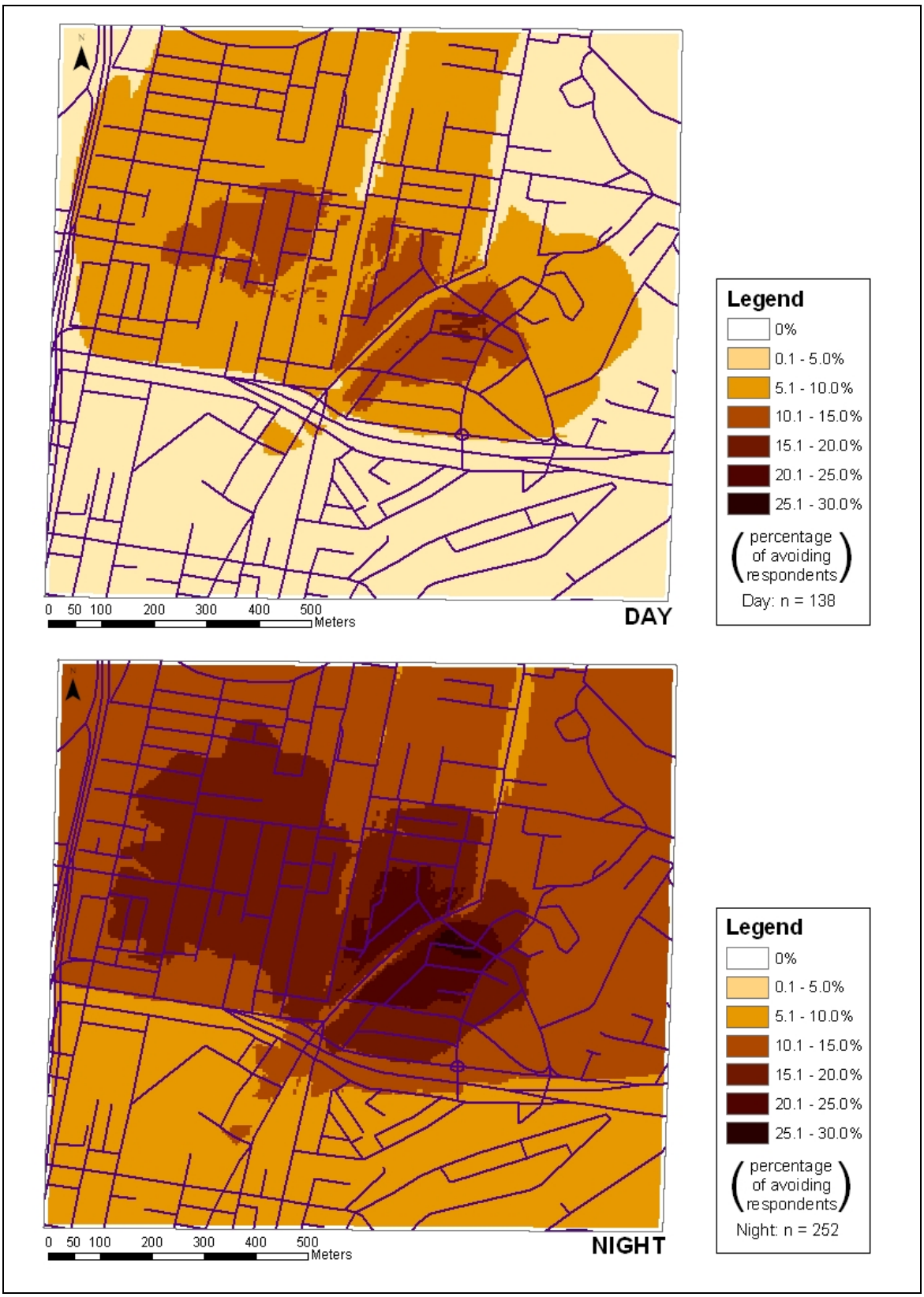


Figure 110. Areas where the survey respondents stated that the presence of RUBBISH / SYRINGES triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 111. Areas where the survey respondents stated that the presence of RUNDOWN / ABANDONED BUILDINGS triggered their fear of being robbed, beaten or attacked – during the day night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 112. Areas where the survey respondents stated that the presence of OFFESIVE / DEGRADED SHOPS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 113. Areas where the survey respondents stated that the presence of AREAS TO HIDE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

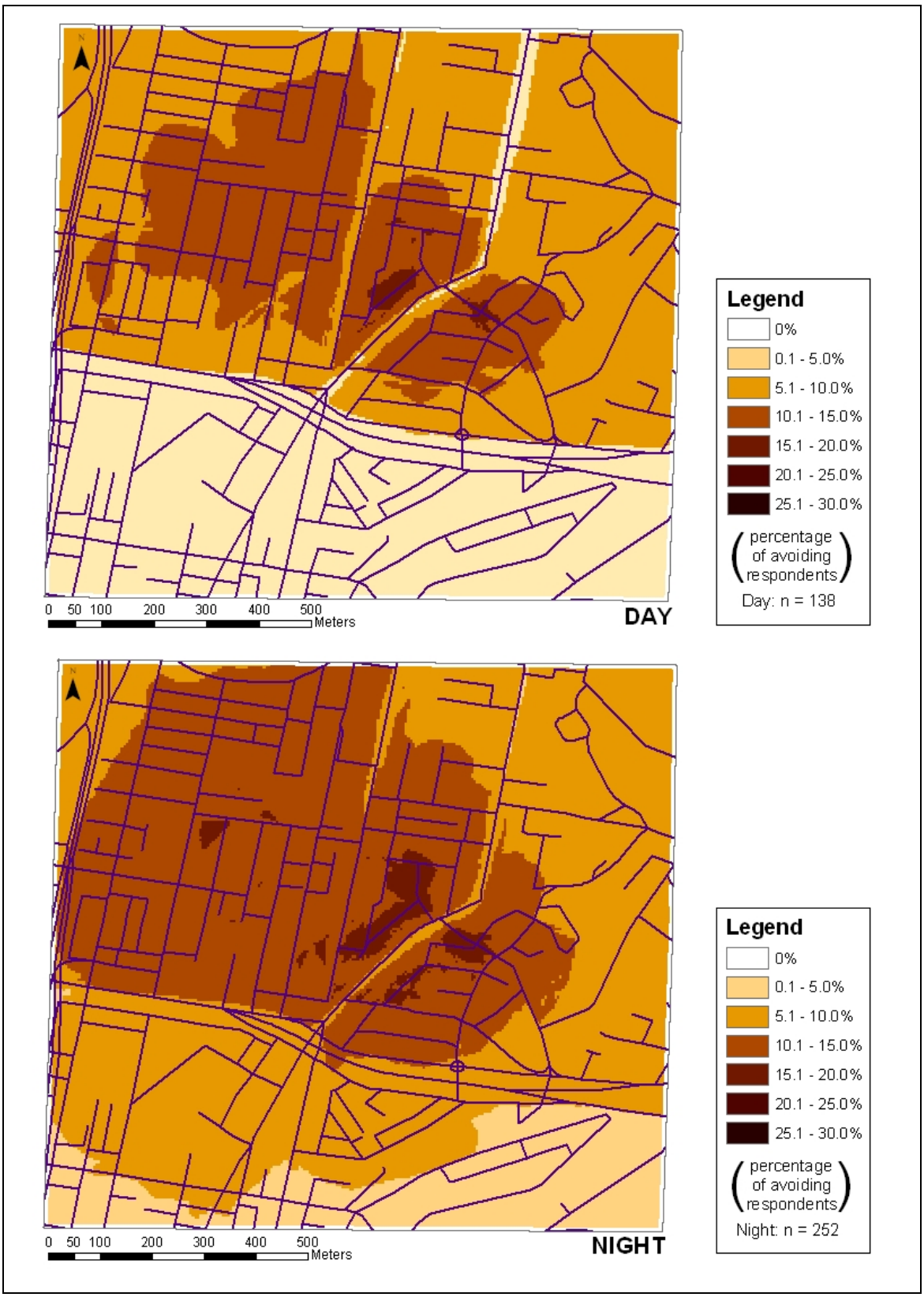


Figure 114. Areas where the survey respondents stated that the presence of BLOCKED ESCAPE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

Figure 115. Areas where the survey respondents stated that the presence of LANEWAYS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using classes representing 5% of avoiding respondents.

15.2. Avoidance density maps used to rank the environmental cues

The method of data classification used in these ‘avoidance density’ maps was employed to help visually rank the environmental cues from highest to lowest according to the number of respondents avoiding each area of the study site (because the environmental cue in question triggered their fear of crime).

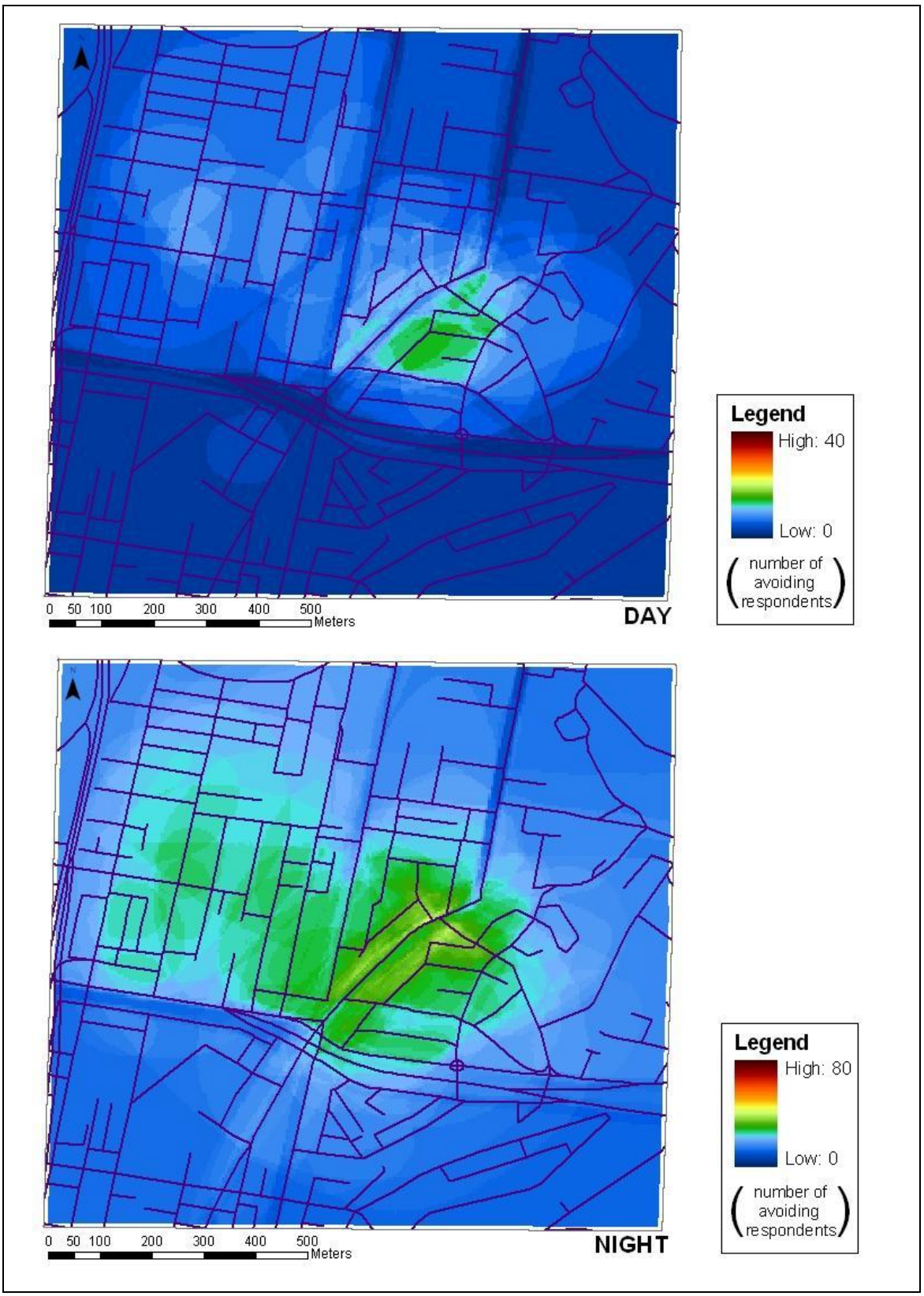


Figure 116. Areas where the survey respondents stated that the presence of SPRUIKERS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

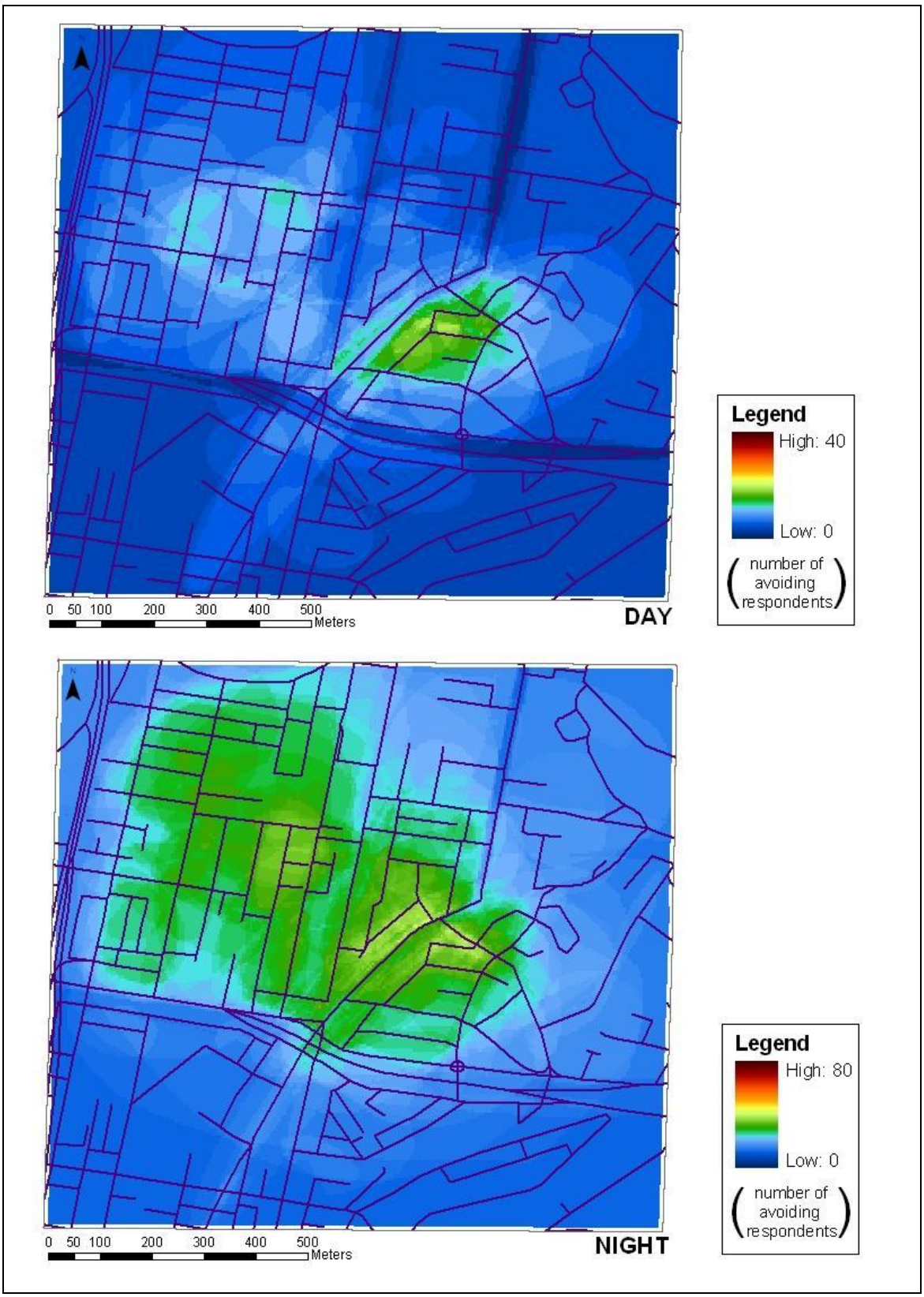


Figure 117. Areas where the survey respondents stated that the presence of HOMELESS people triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

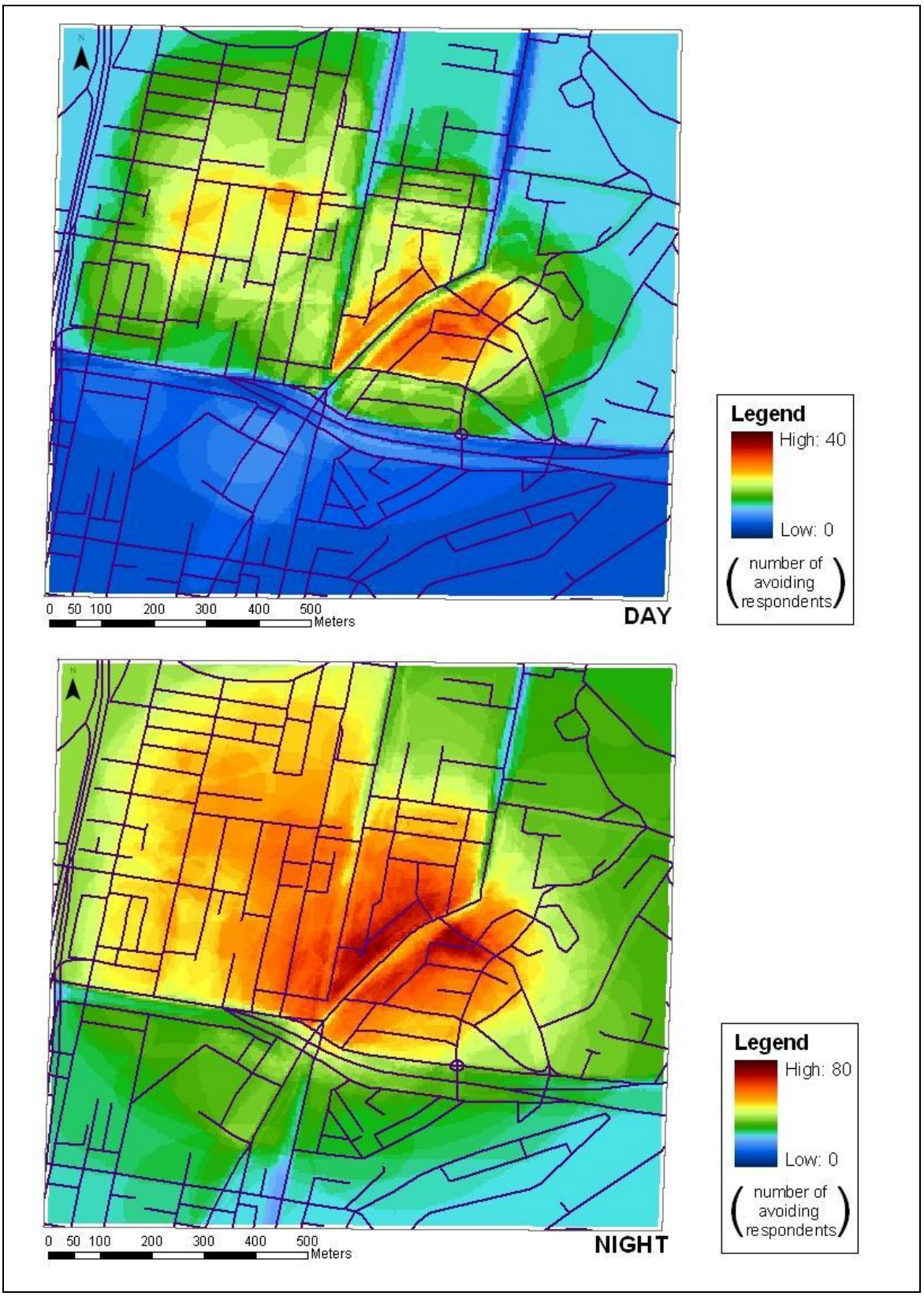


Figure 118. Areas where the survey respondents stated that the presence of INTOXICATED PERSONS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

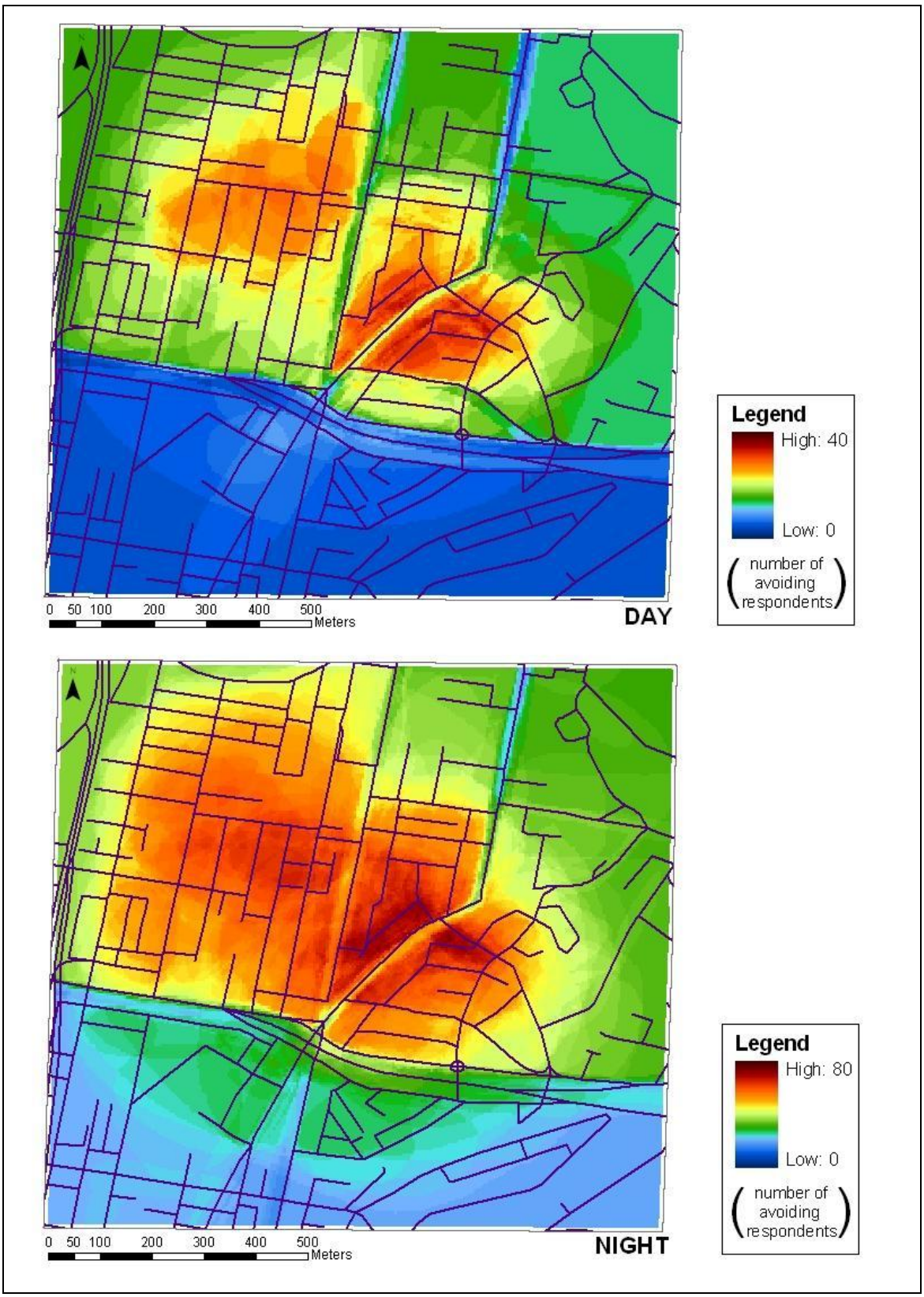


Figure 119. Areas where the survey respondents stated that the presence of GANGS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

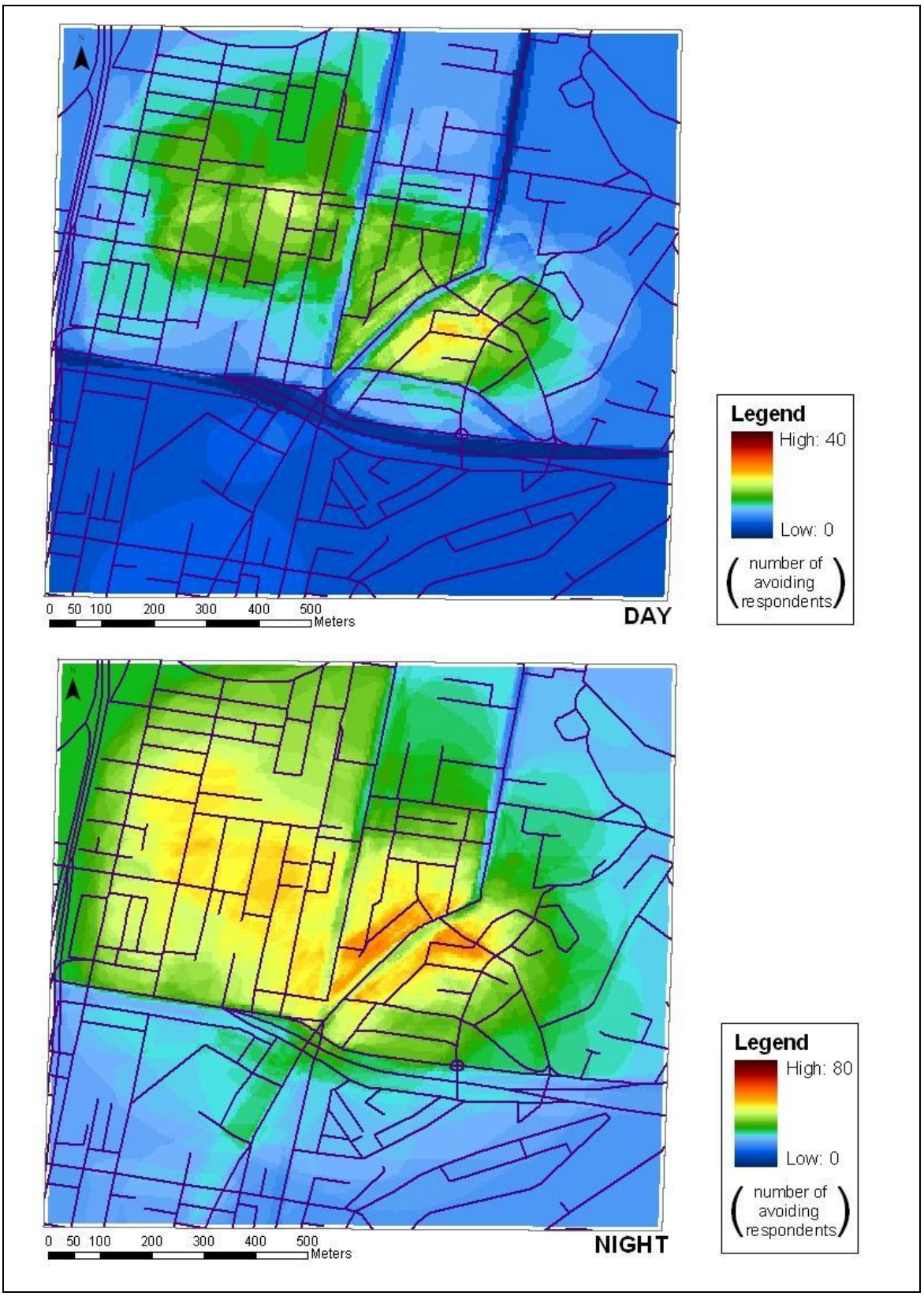


Figure 120. Areas where the survey respondents stated that the presence of LOITERING PEOPLE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

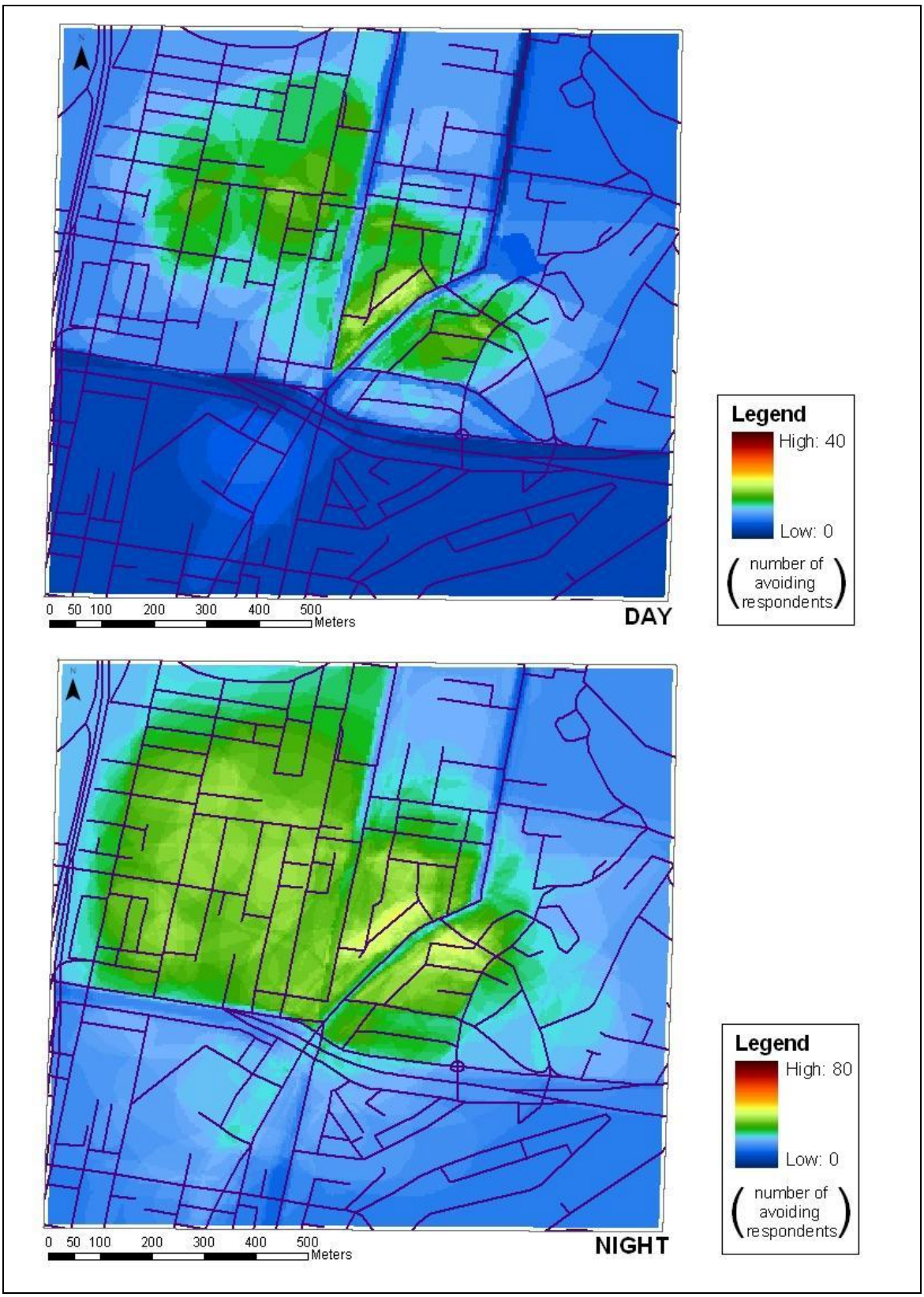


Figure 121. Areas where the survey respondents stated PEDESTRIAN ABSENCE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

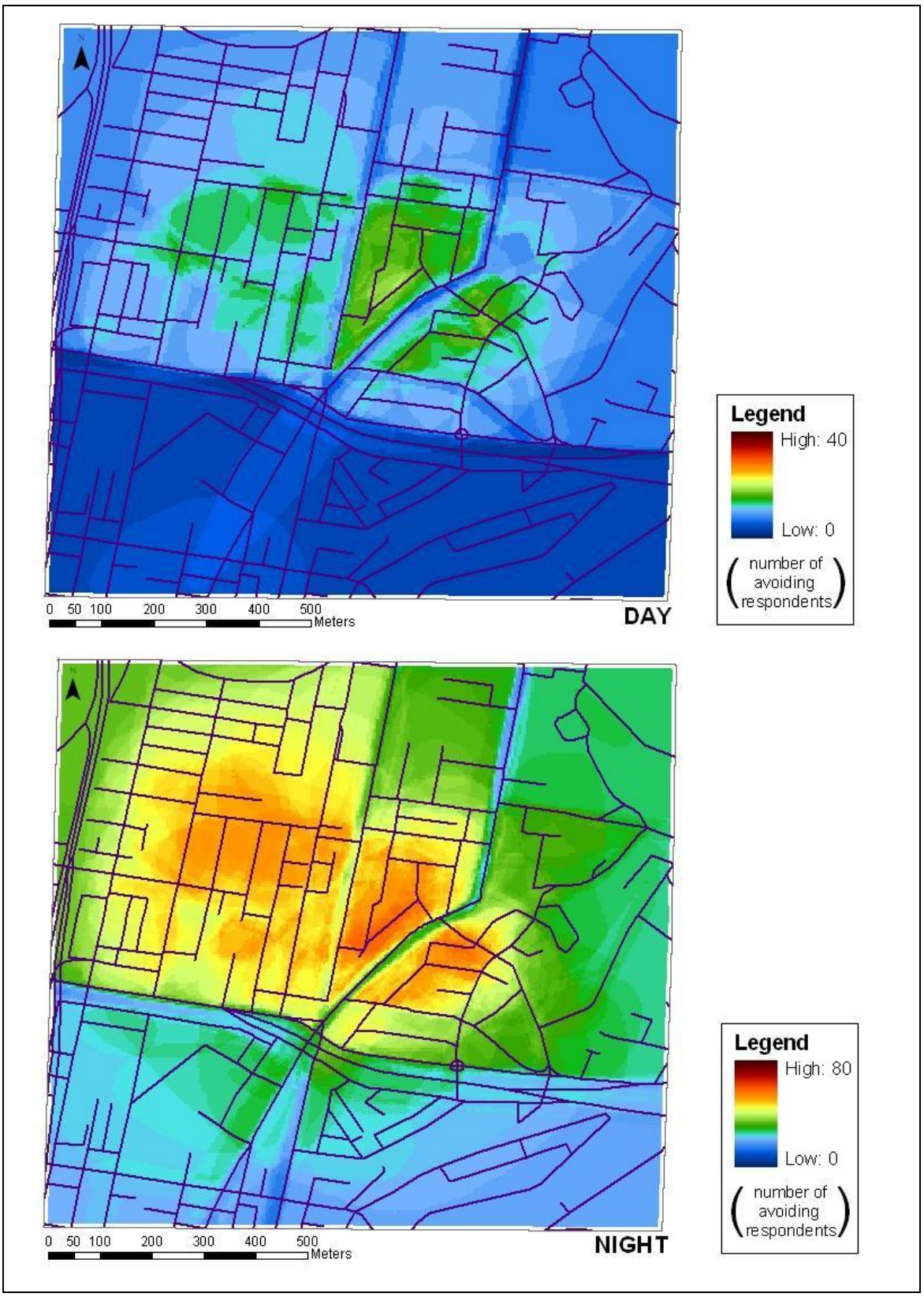


Figure 122. Areas where the survey respondents stated POOR STREET LIGHTING triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

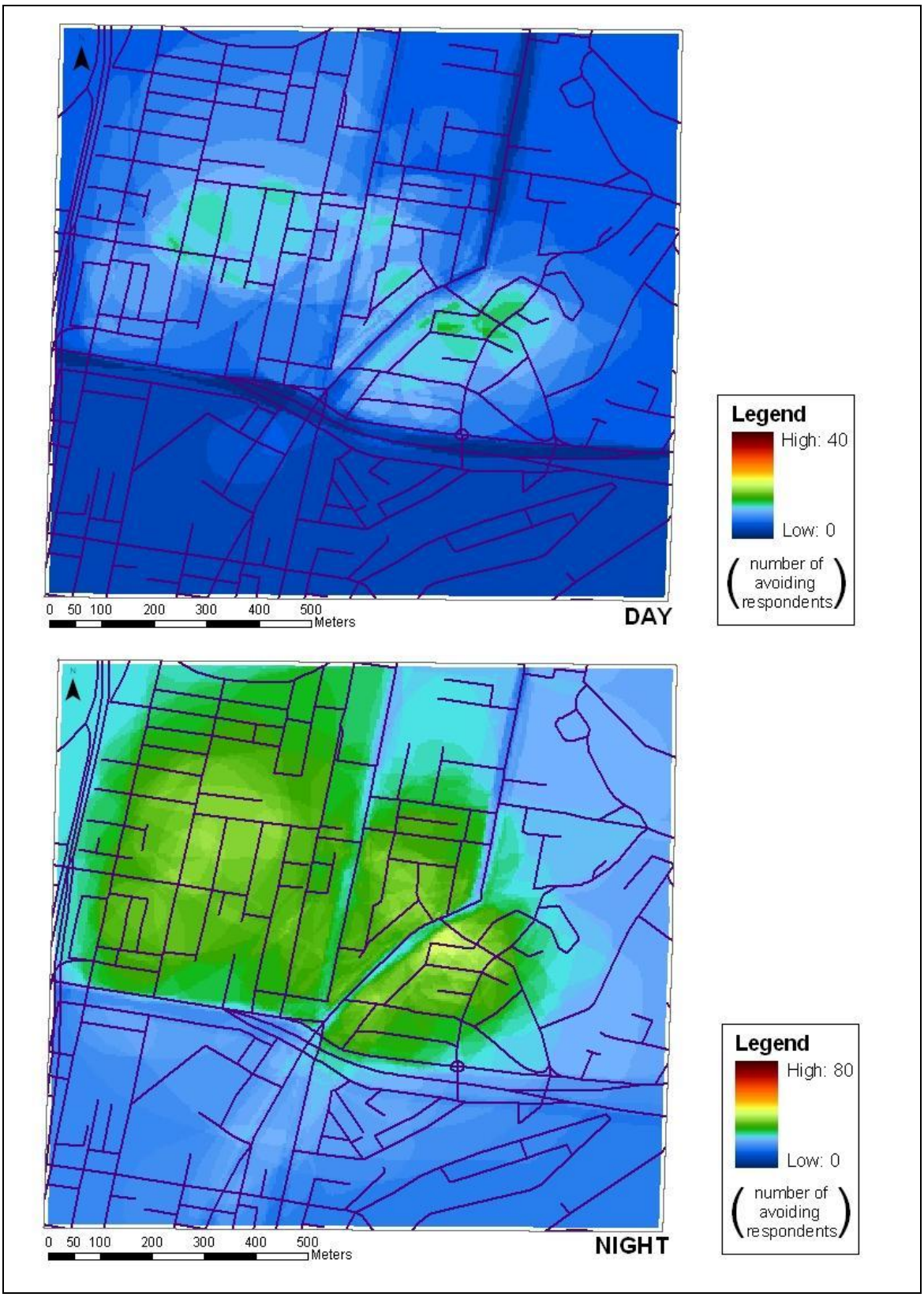


Figure 123. Areas where the survey respondents stated that the presence of VANDALISM triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

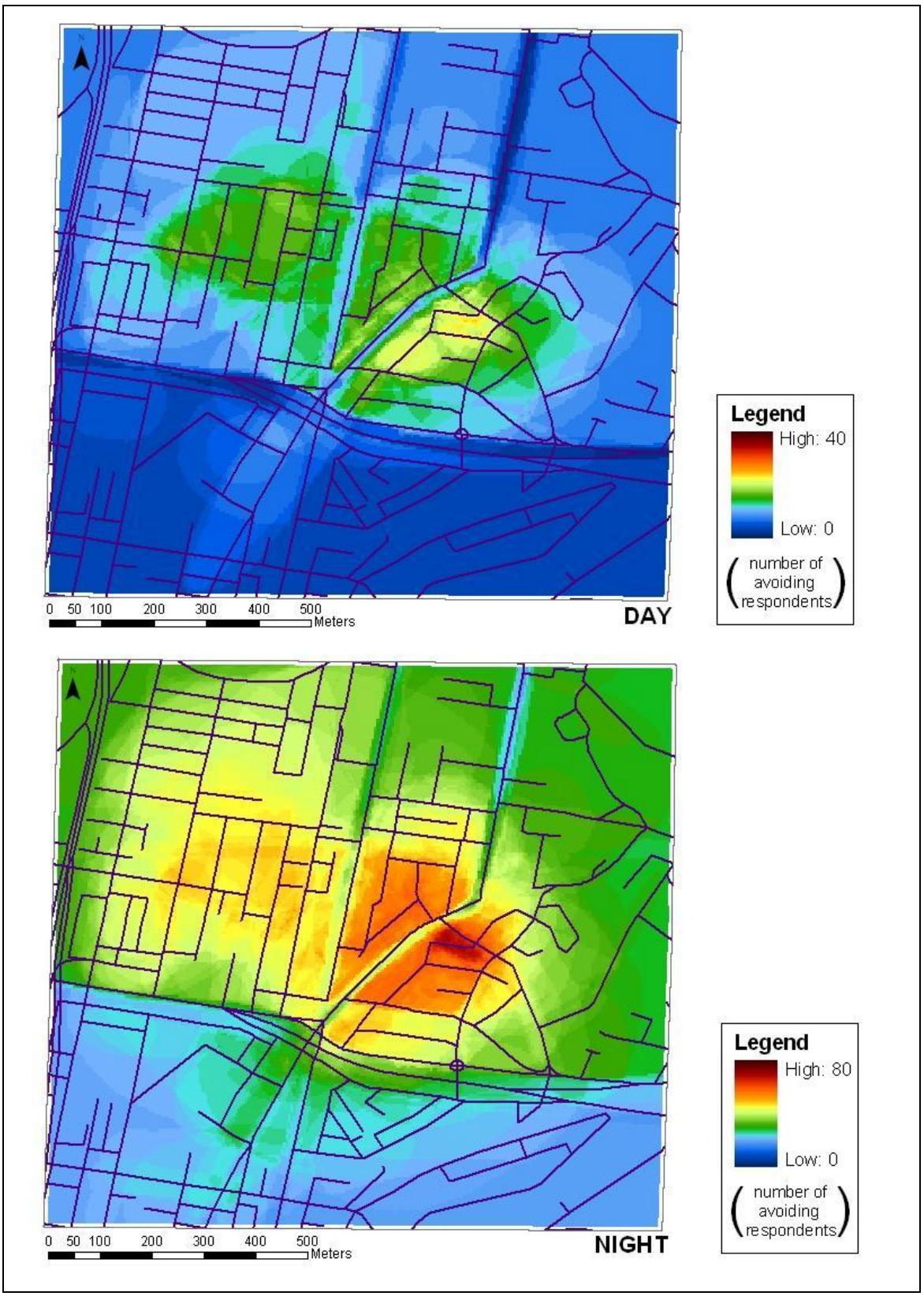


Figure 124. Areas where the survey respondents stated that the presence of RUBBISH / SYRINGES triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

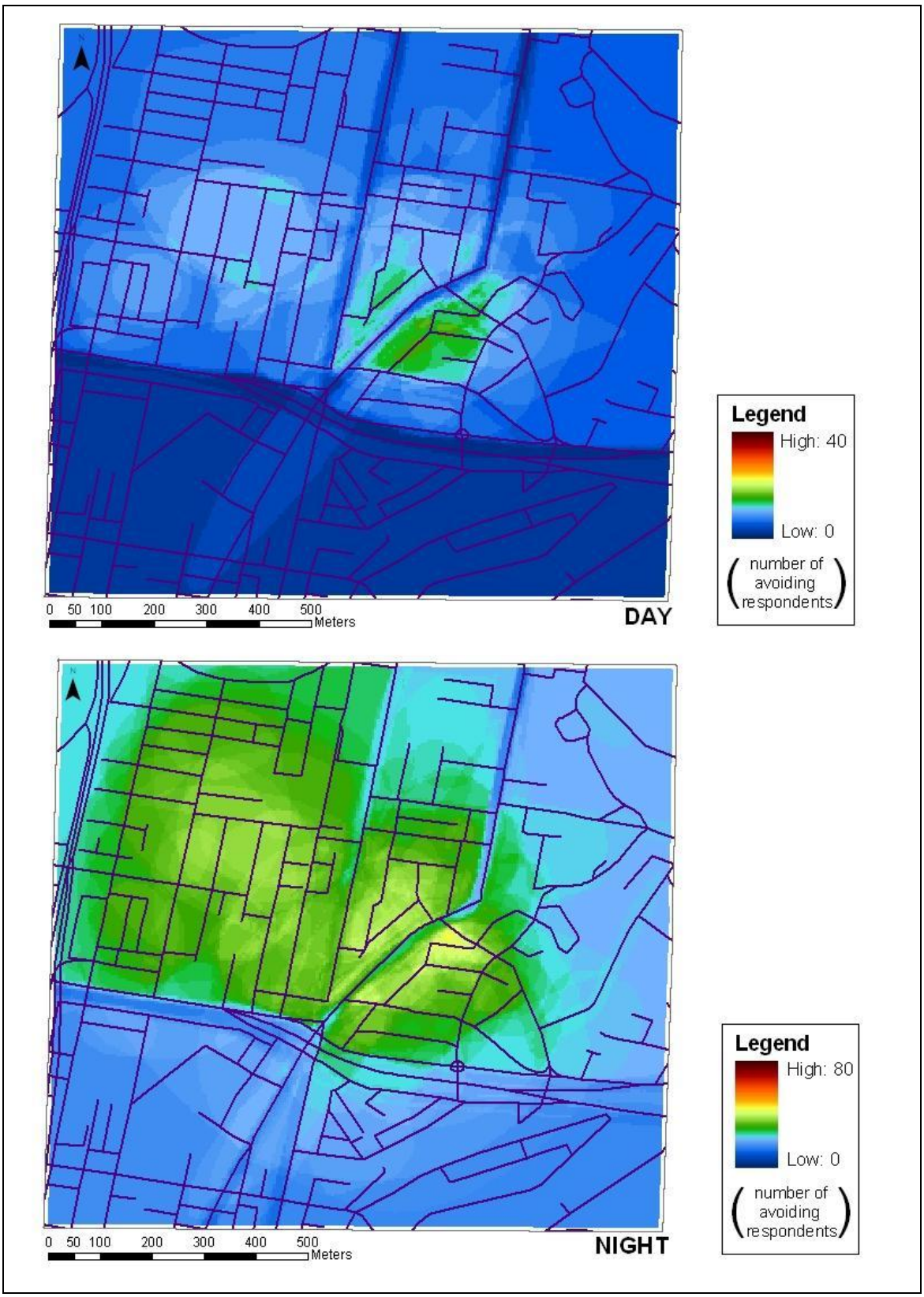


Figure 125. Areas where the survey respondents stated that the presence of RUNDOWN / ABANDONED BUILDINGS triggered their fear of being robbed, beaten or attacked – during the day night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

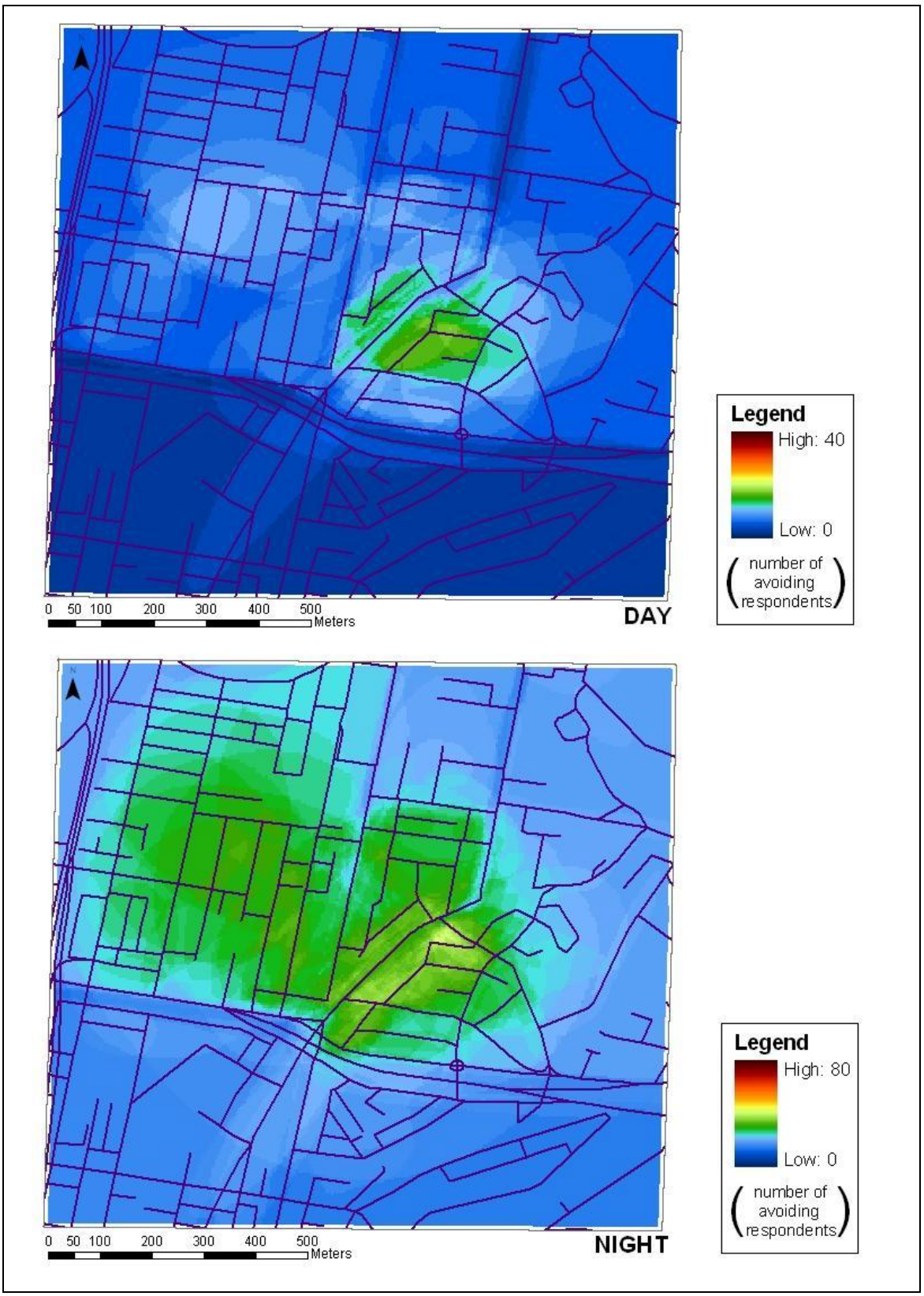


Figure 126. Areas where the survey respondents stated that the presence of OFFESIVE / DEGRADED SHOPS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

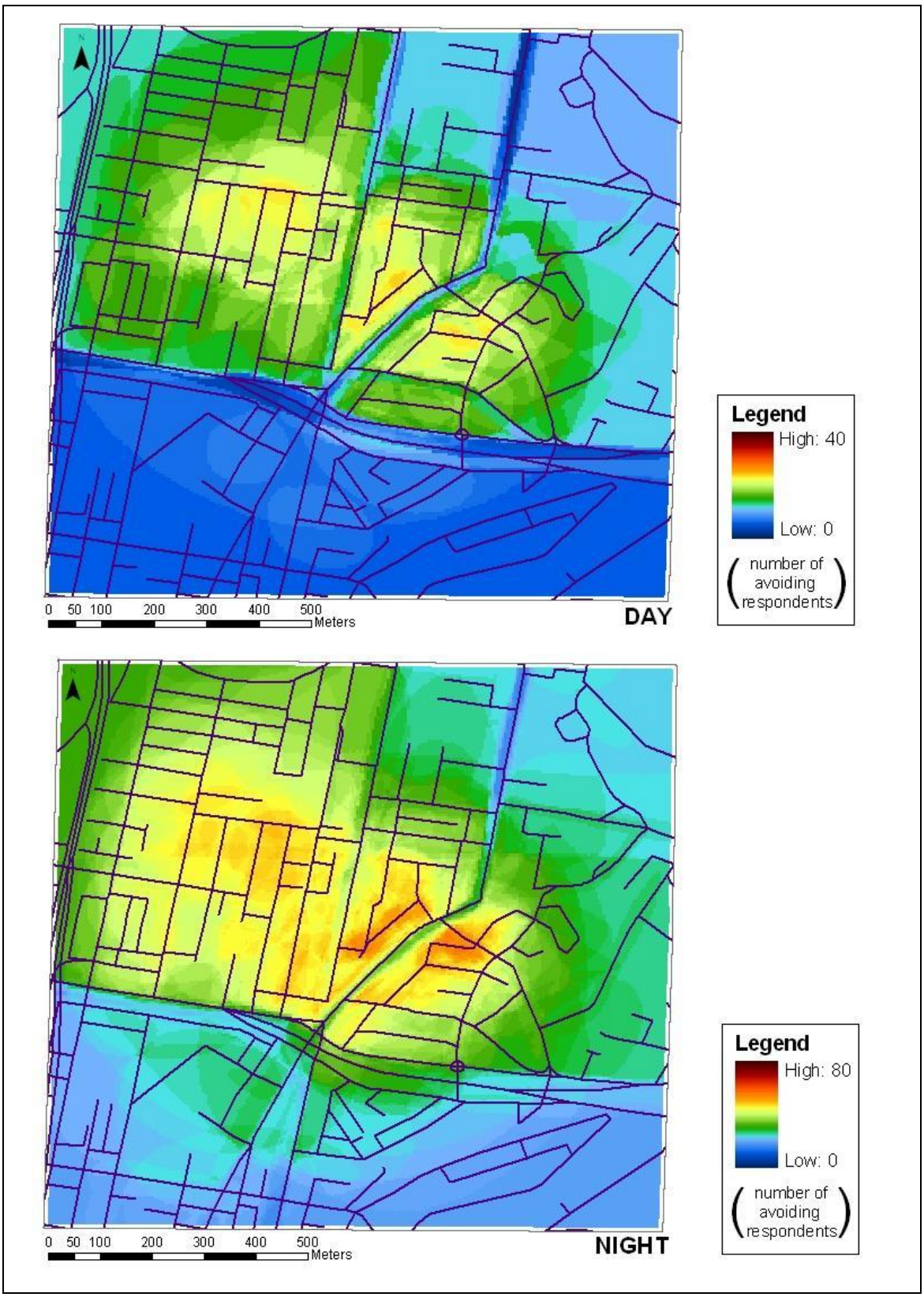


Figure 127. Areas where the survey respondents stated that the presence of AREAS TO HIDE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

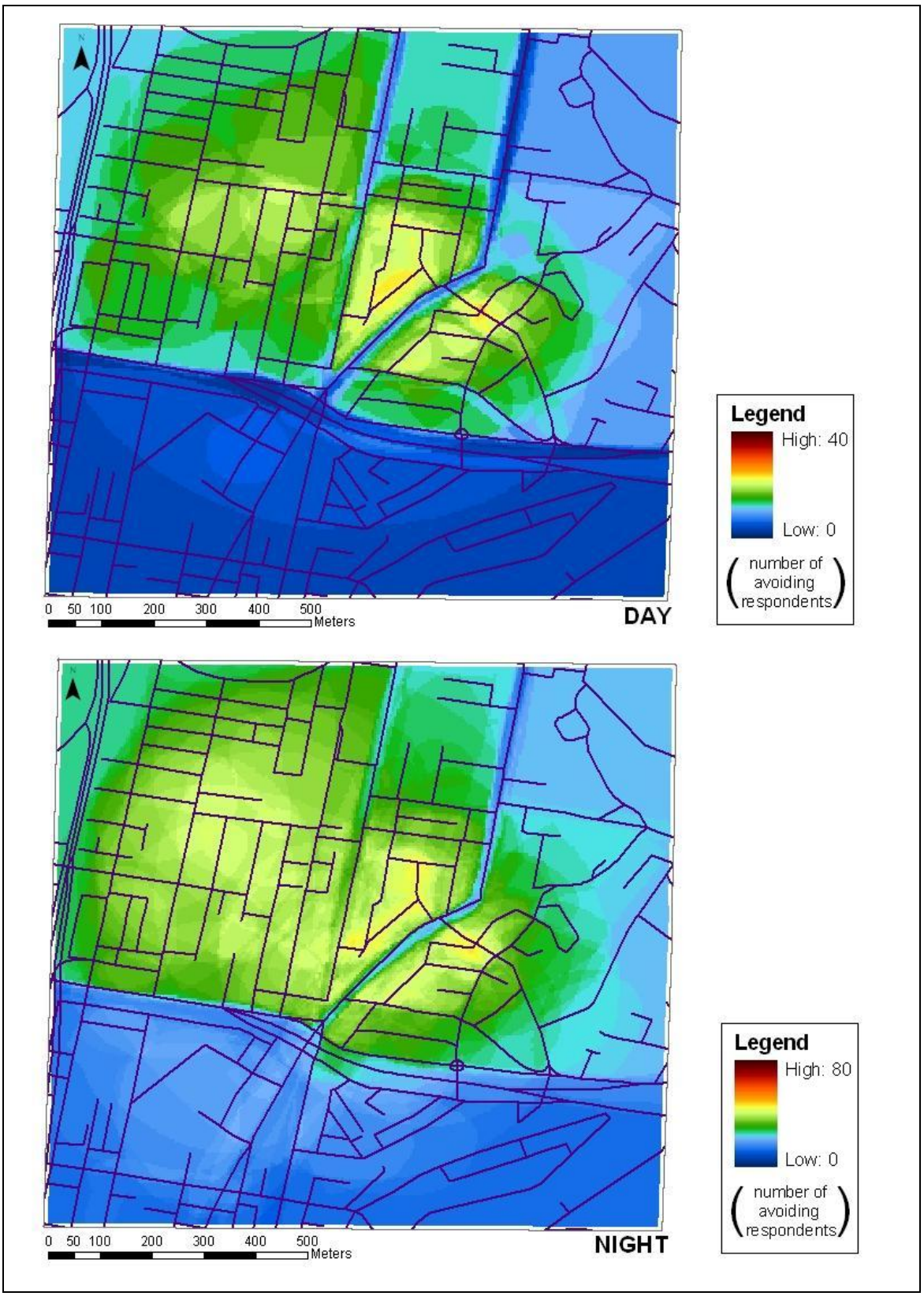


Figure 128. Areas where the survey respondents stated that the presence of BLOCKED ESCAPE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

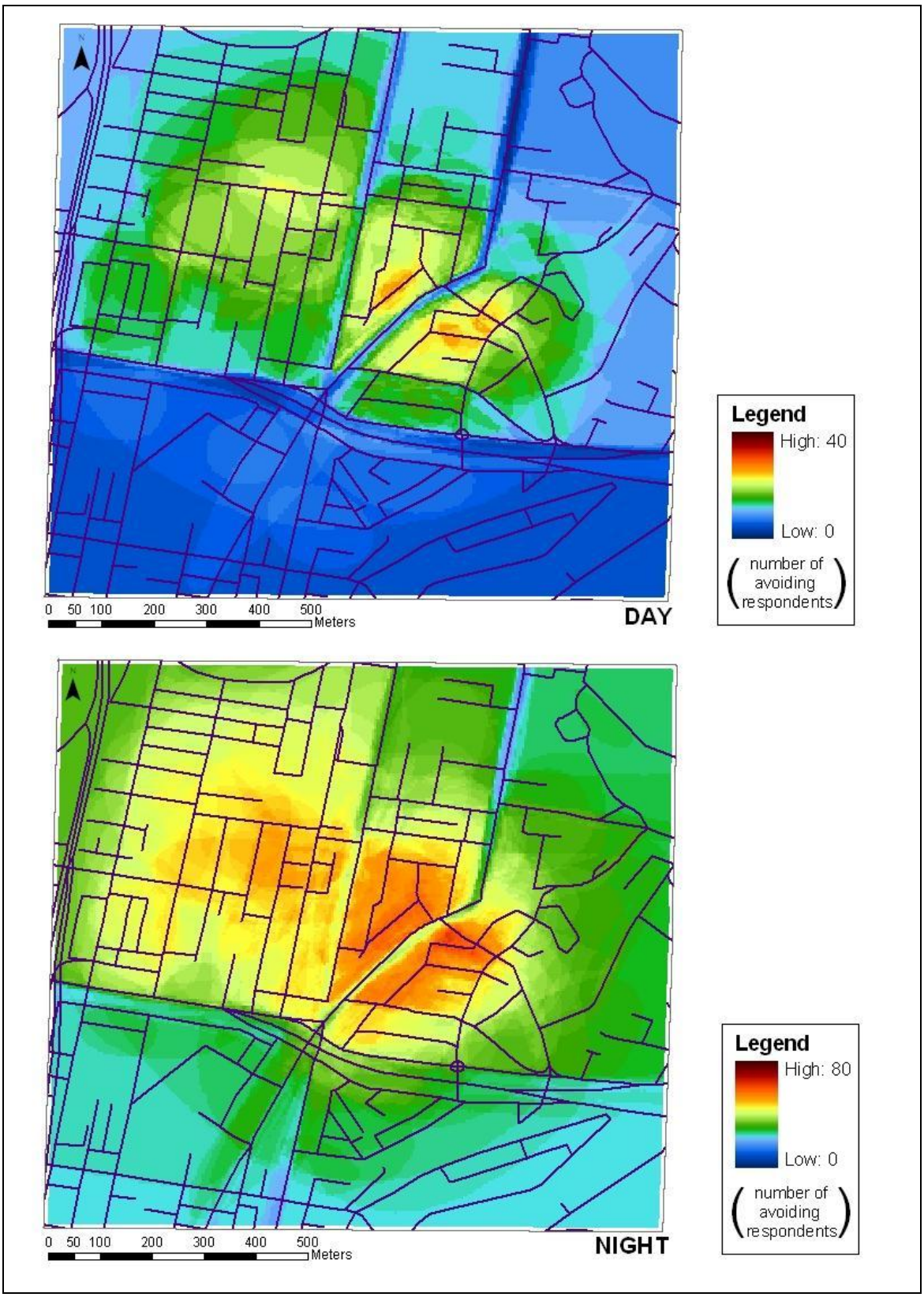


Figure 129. Areas where the survey respondents stated that the presence of LANEWAYS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and maximum of 40 for the day and 80 for the night.

15.3. Avoidance density maps used to highlight temporal changes

The method of data classification used in these ‘avoidance density’ maps was employed to illustrate temporal changes between the number of respondents avoiding each area (of the study site because the environmental cue in question triggered their fear of crime) in the day and night.

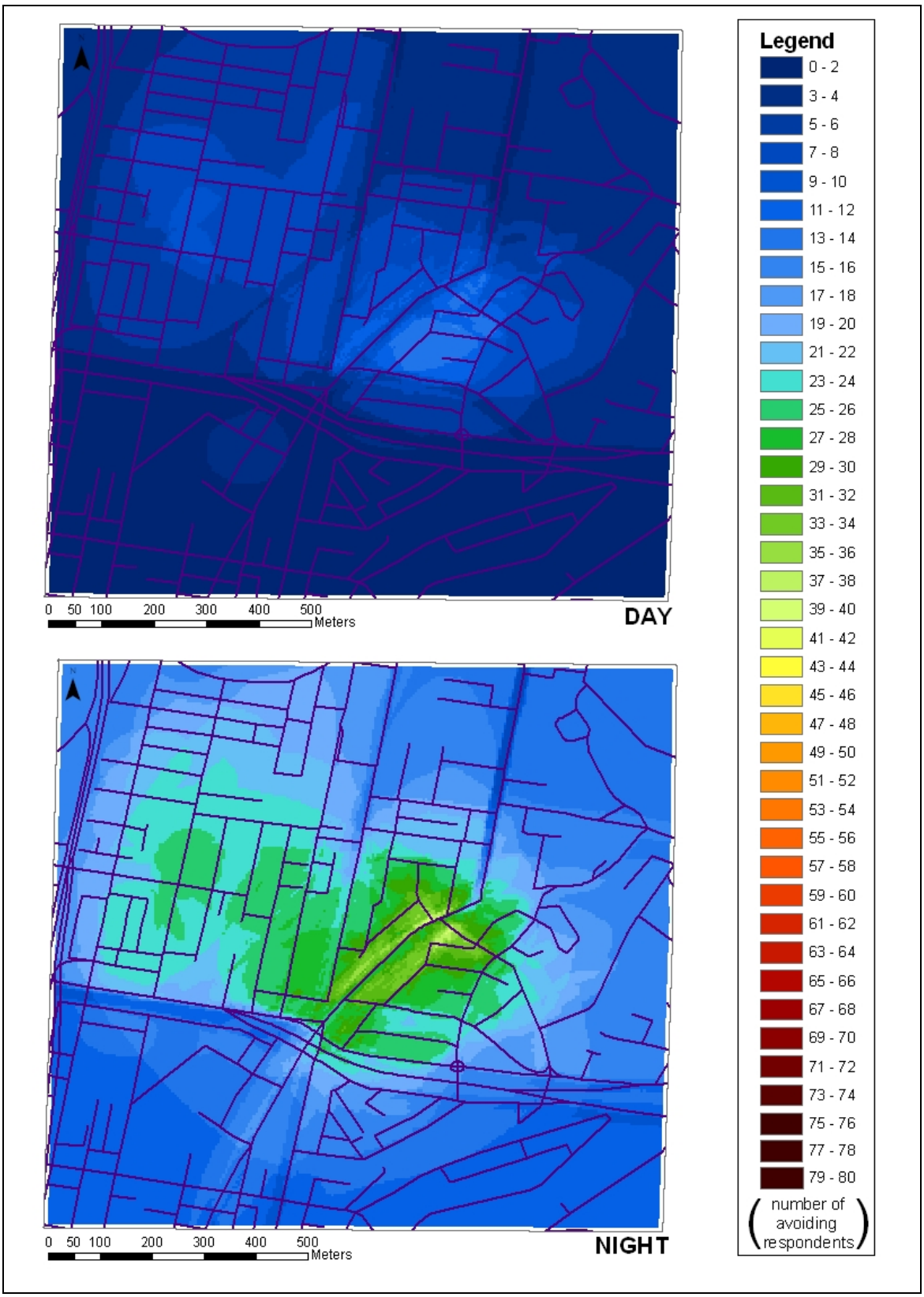


Figure 130. Areas where the survey respondents stated that the presence of SPRUIKERS triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

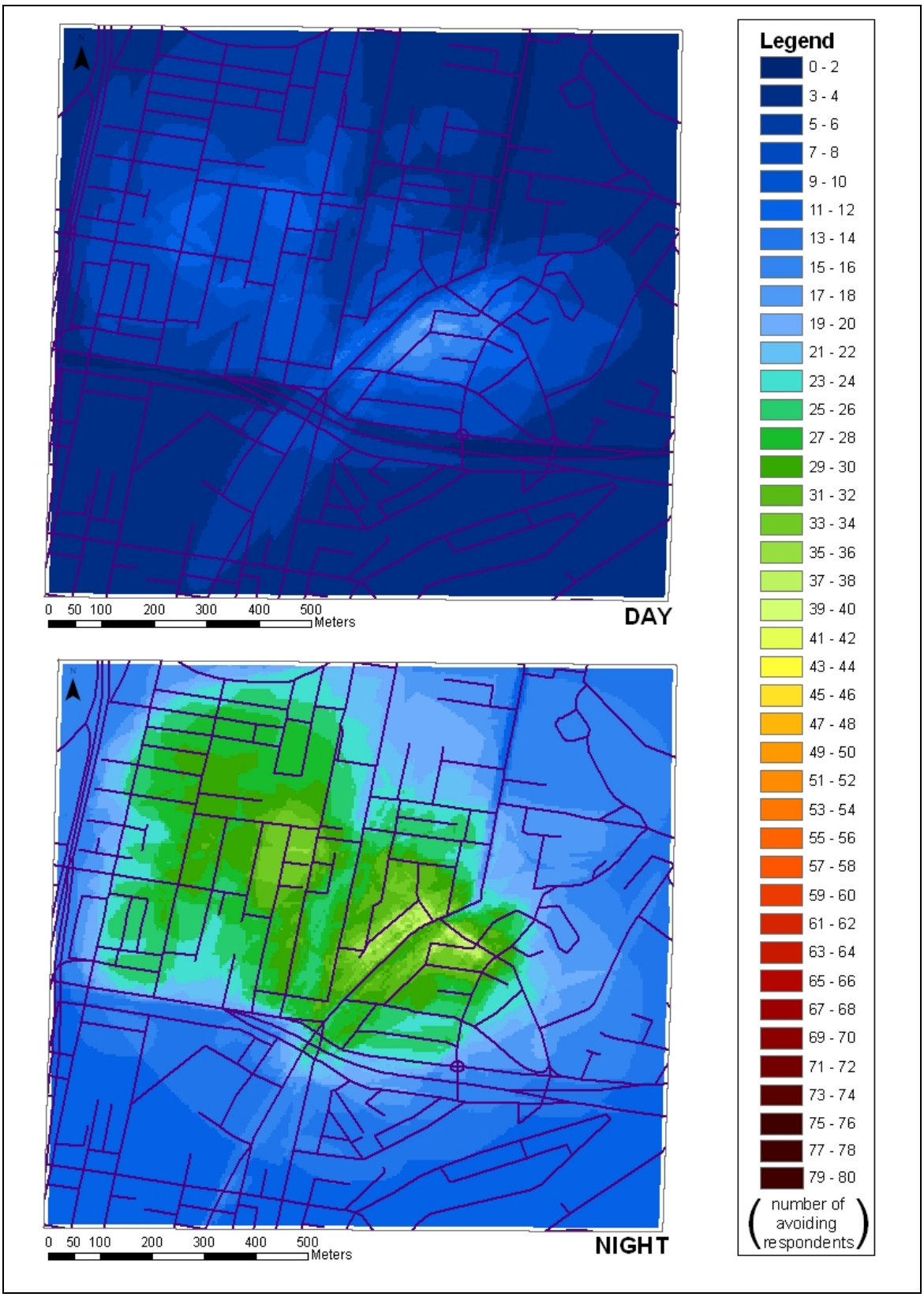


Figure 131. Areas where the survey respondents stated that the presence of HOMELESS people triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

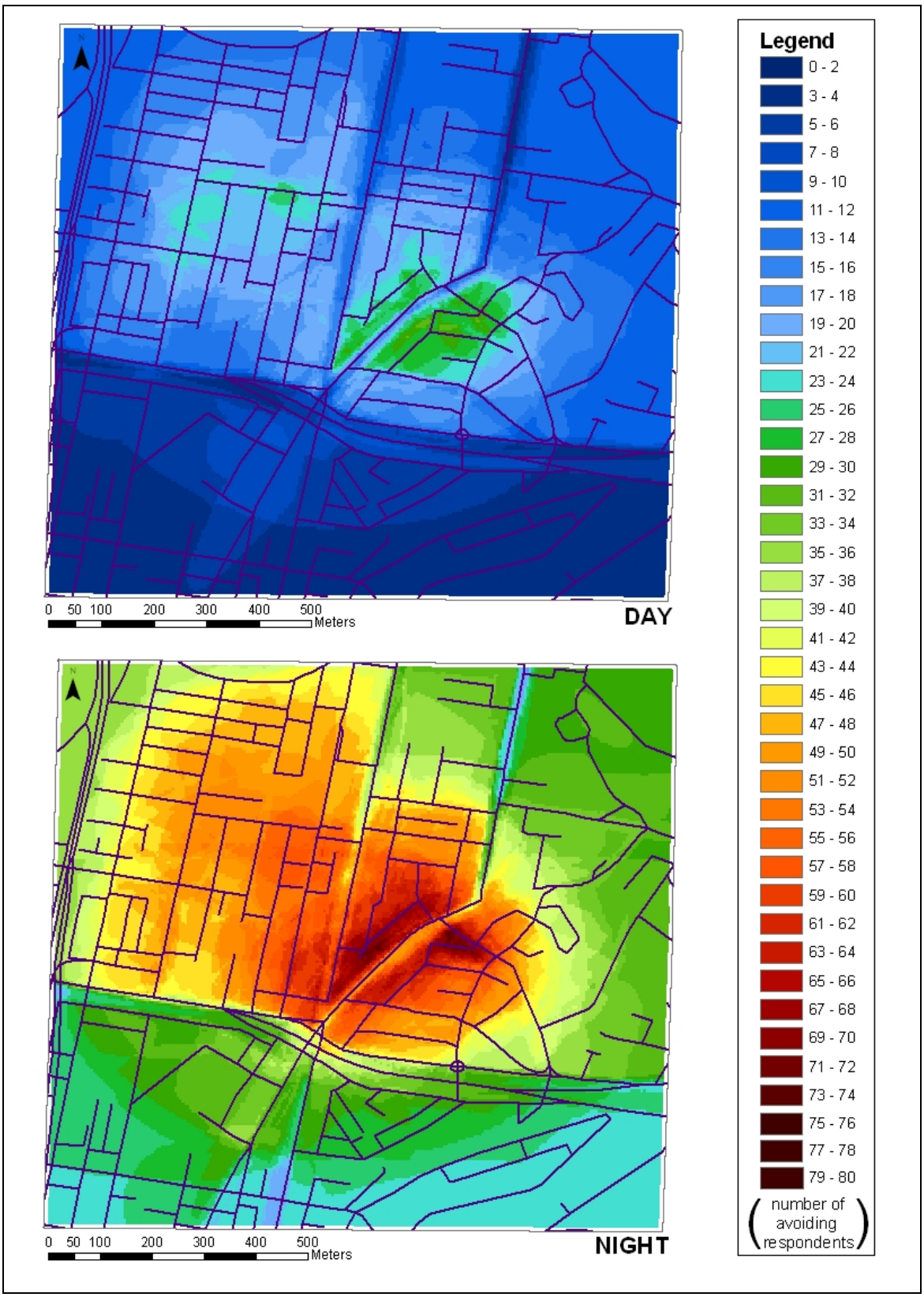


Figure 132. Areas where the survey respondents stated that the presence of INTOXICATED PERSONS triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

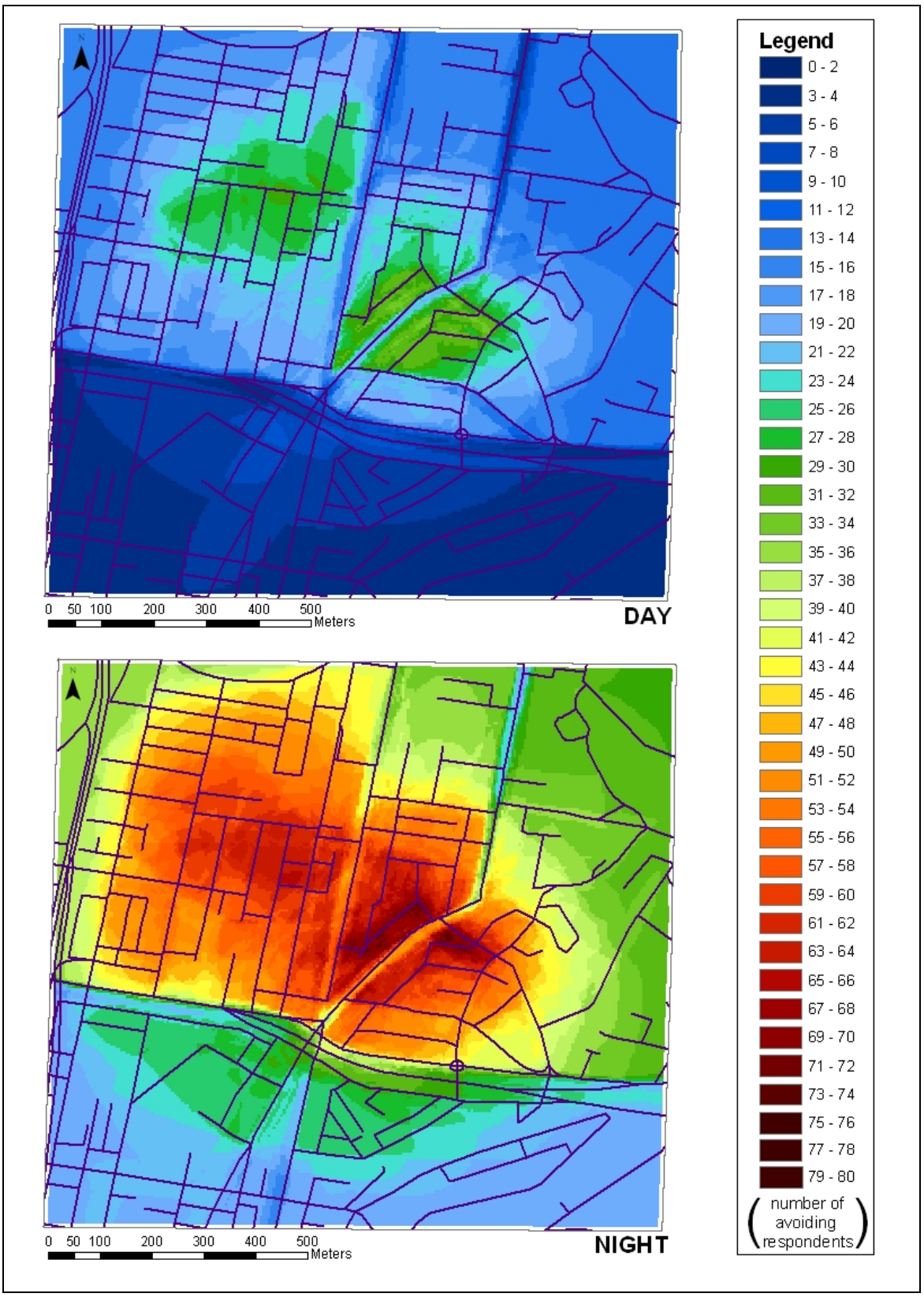


Figure 133. Areas where the survey respondents stated that the presence of GANGS triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

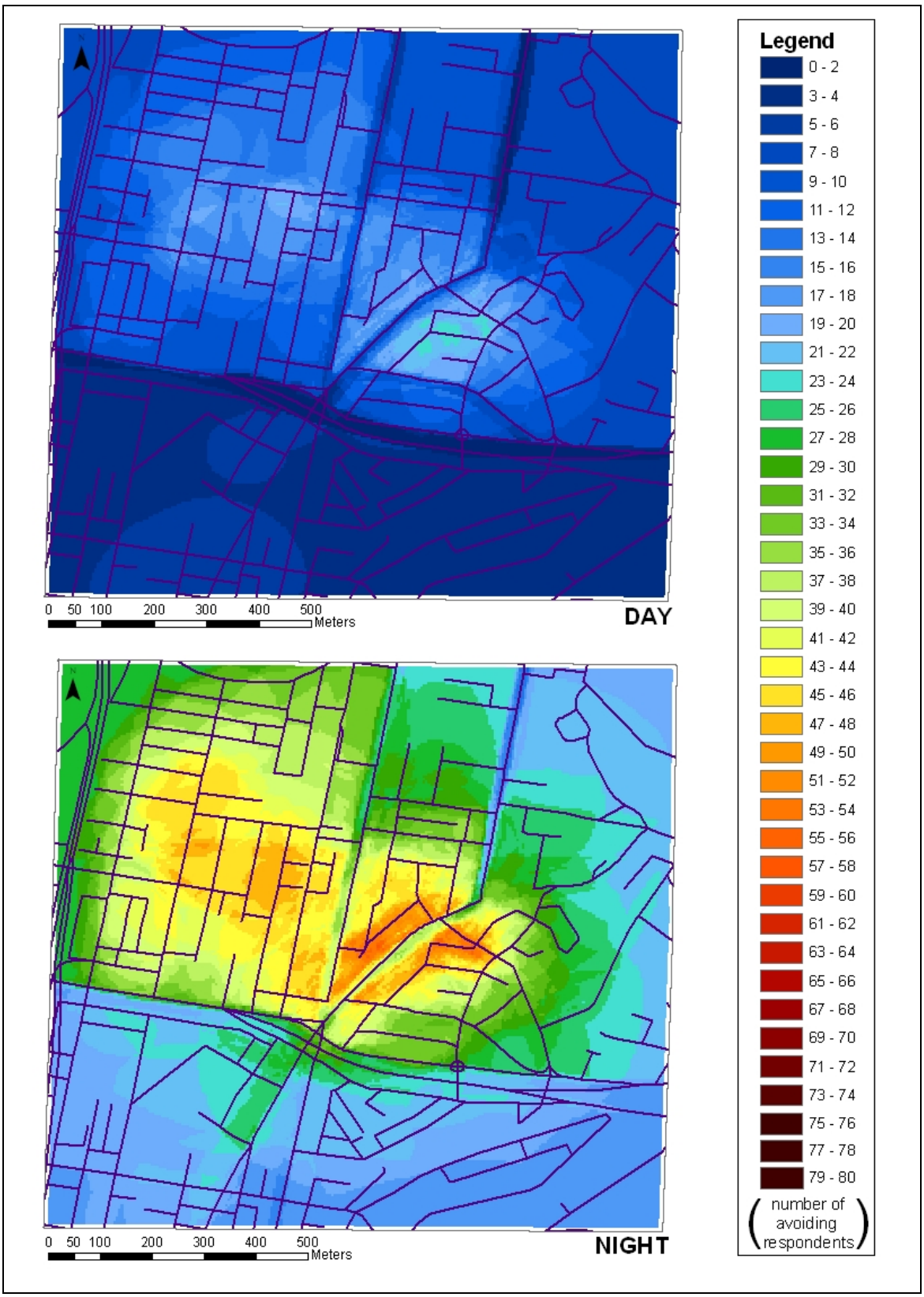


Figure 134. Areas where the survey respondents stated that the presence of LOITERING PEOPLE triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

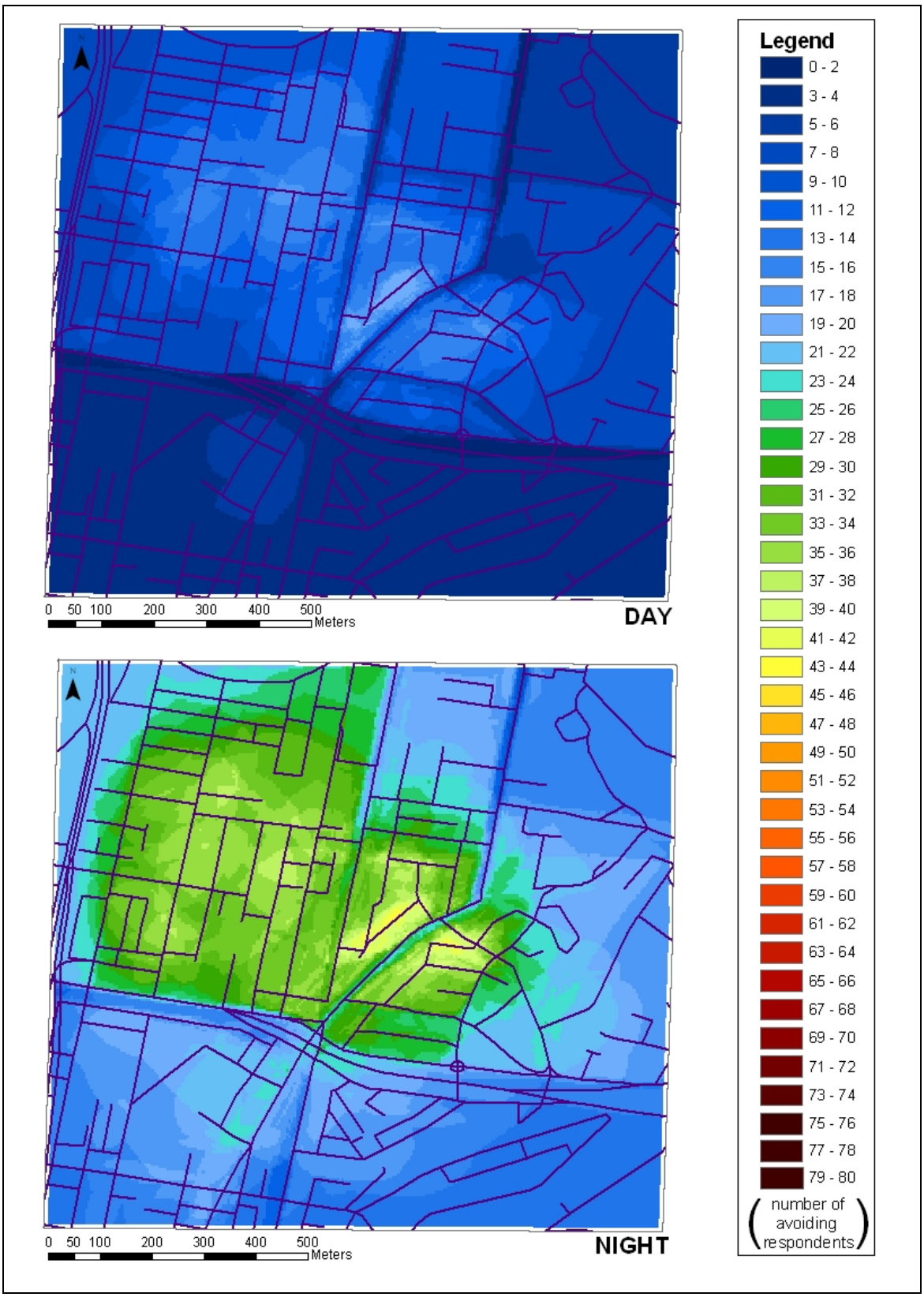


Figure 135. Areas where the survey respondents stated PEDESTRIAN ABSENCE triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

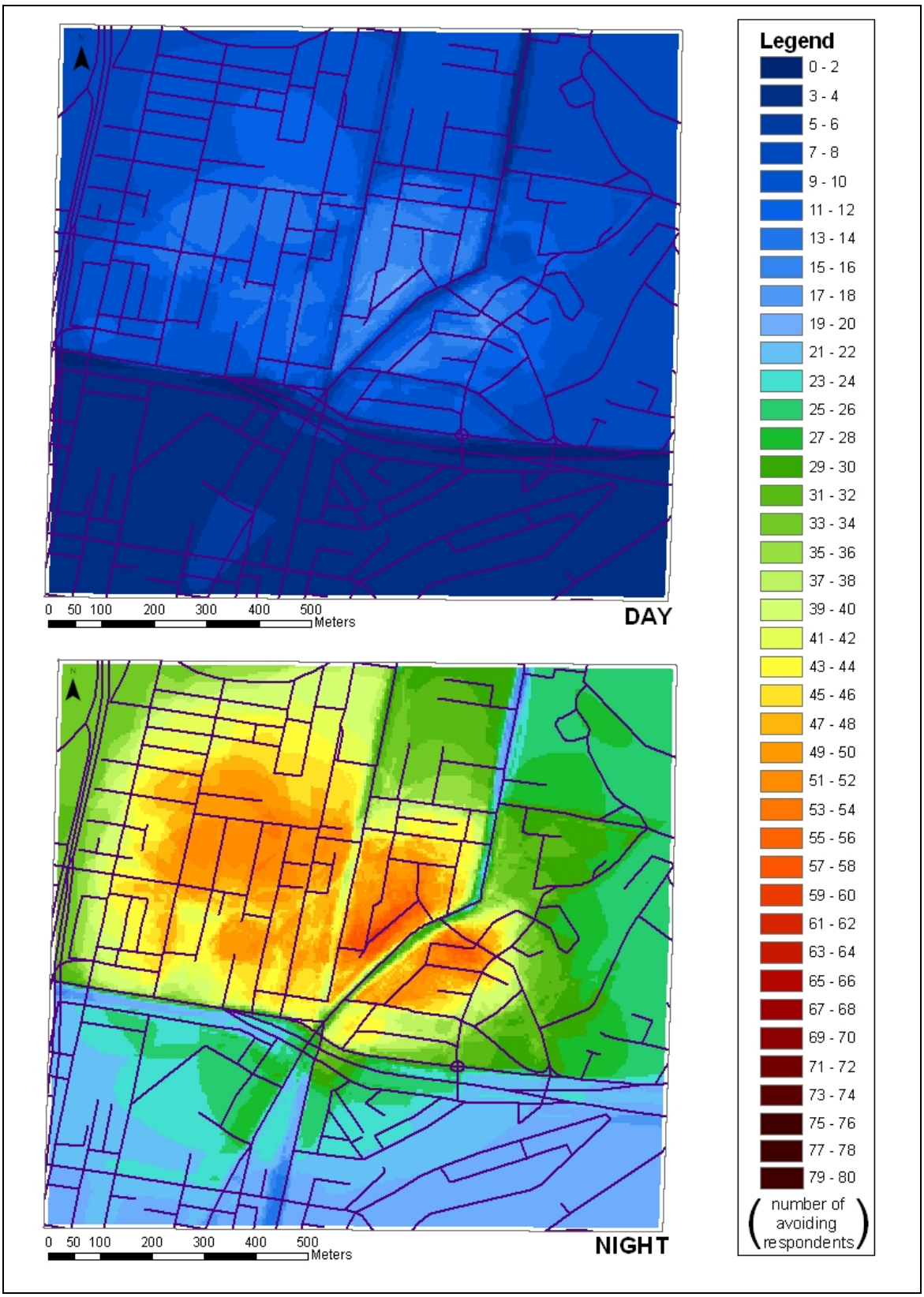


Figure 136. Areas where the survey respondents stated POOR STREET LIGHTING triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

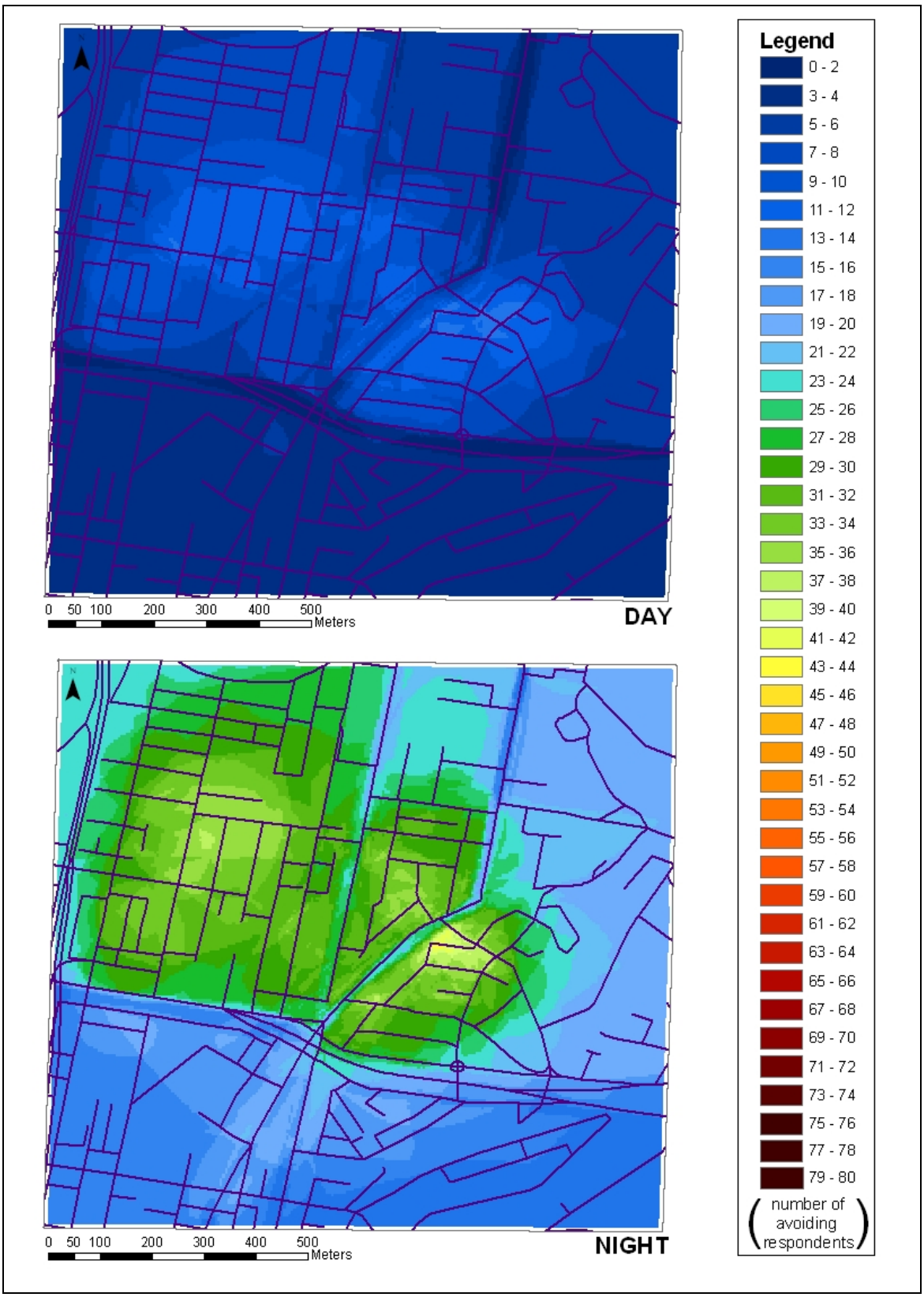


Figure 137. Areas where the survey respondents stated that the presence of VANDALISM triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

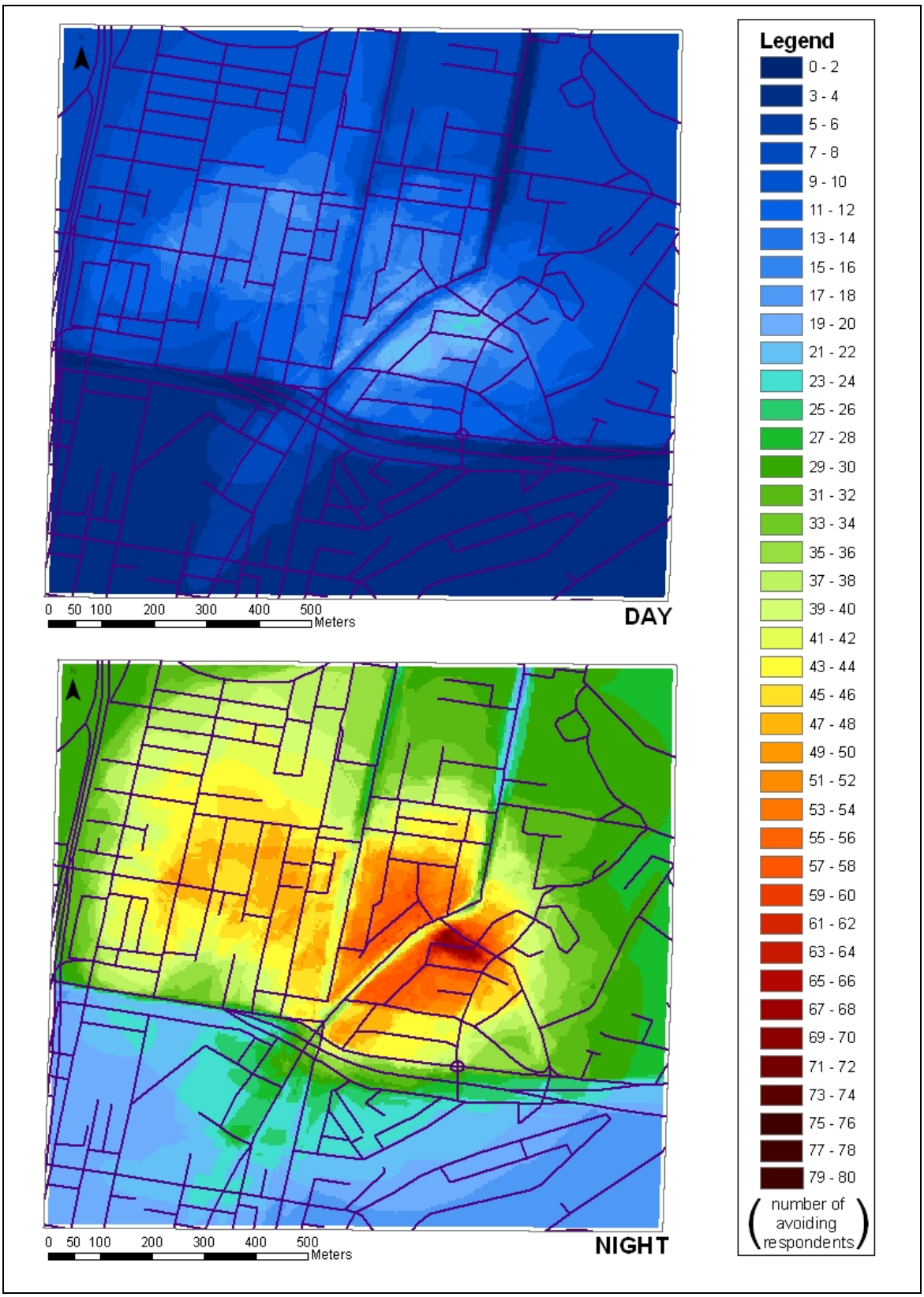


Figure 138. Areas where the survey respondents stated that the presence of RUBBISH / SYRINGES triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

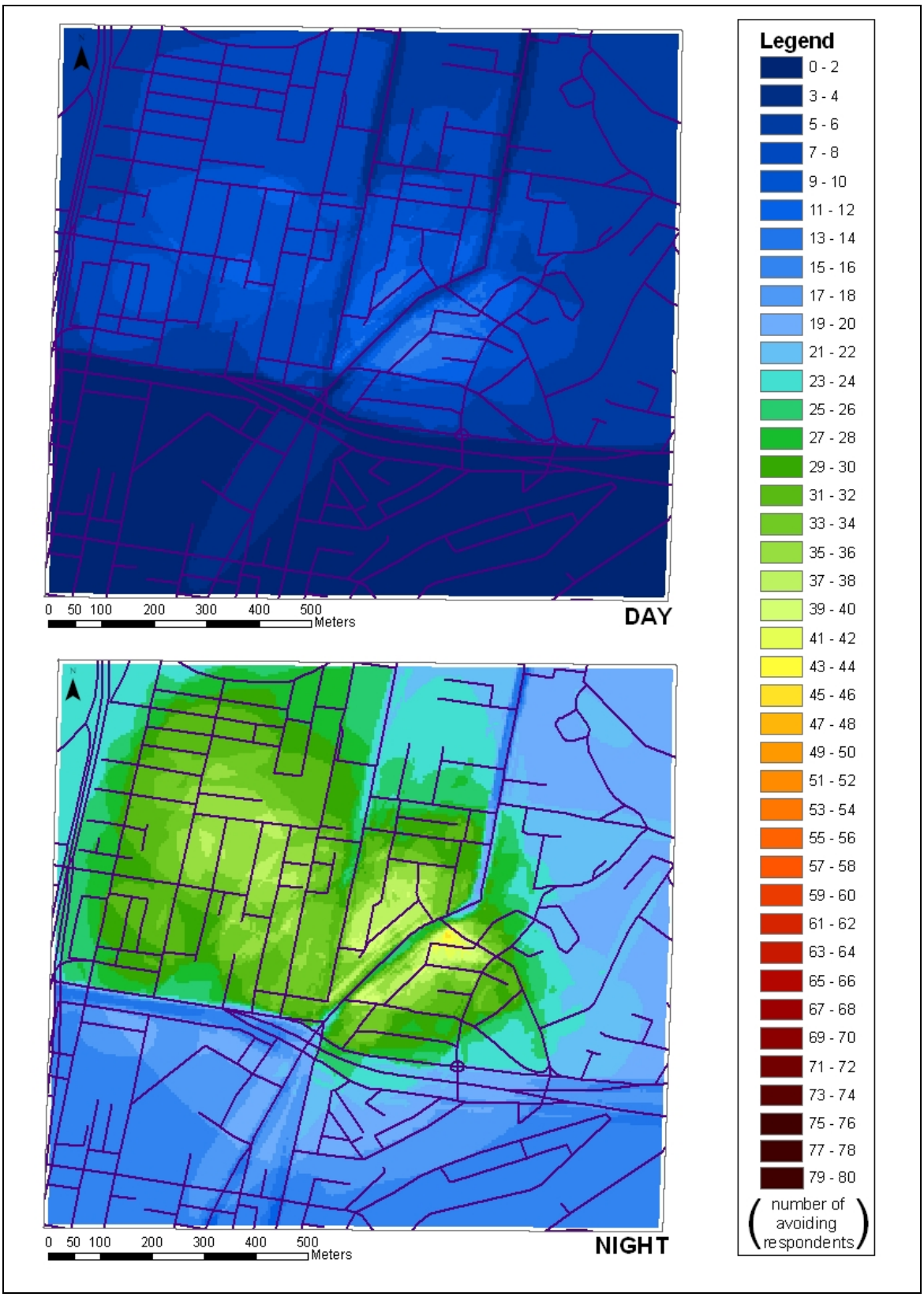


Figure 139. Areas where the survey respondents stated that the presence of RUNDOWN / ABANDONED BUILDINGS triggered their fear of being robbed, beaten or attacked – during the day night. Aggregate population data for each area is categorised into classes of two.

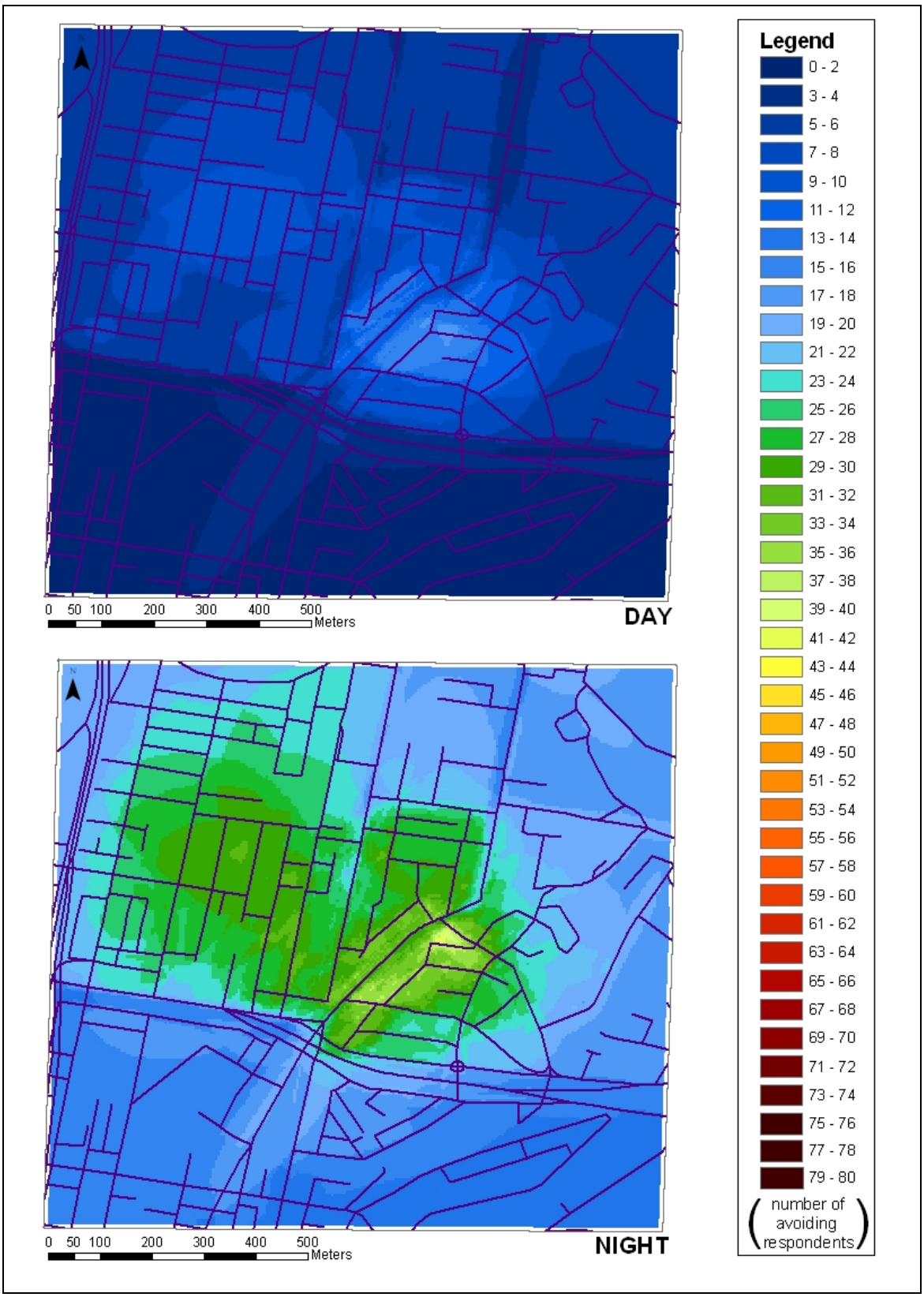


Figure 140. Areas where the survey respondents stated that the presence of OFFESIVE / DEGRADED SHOPS triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

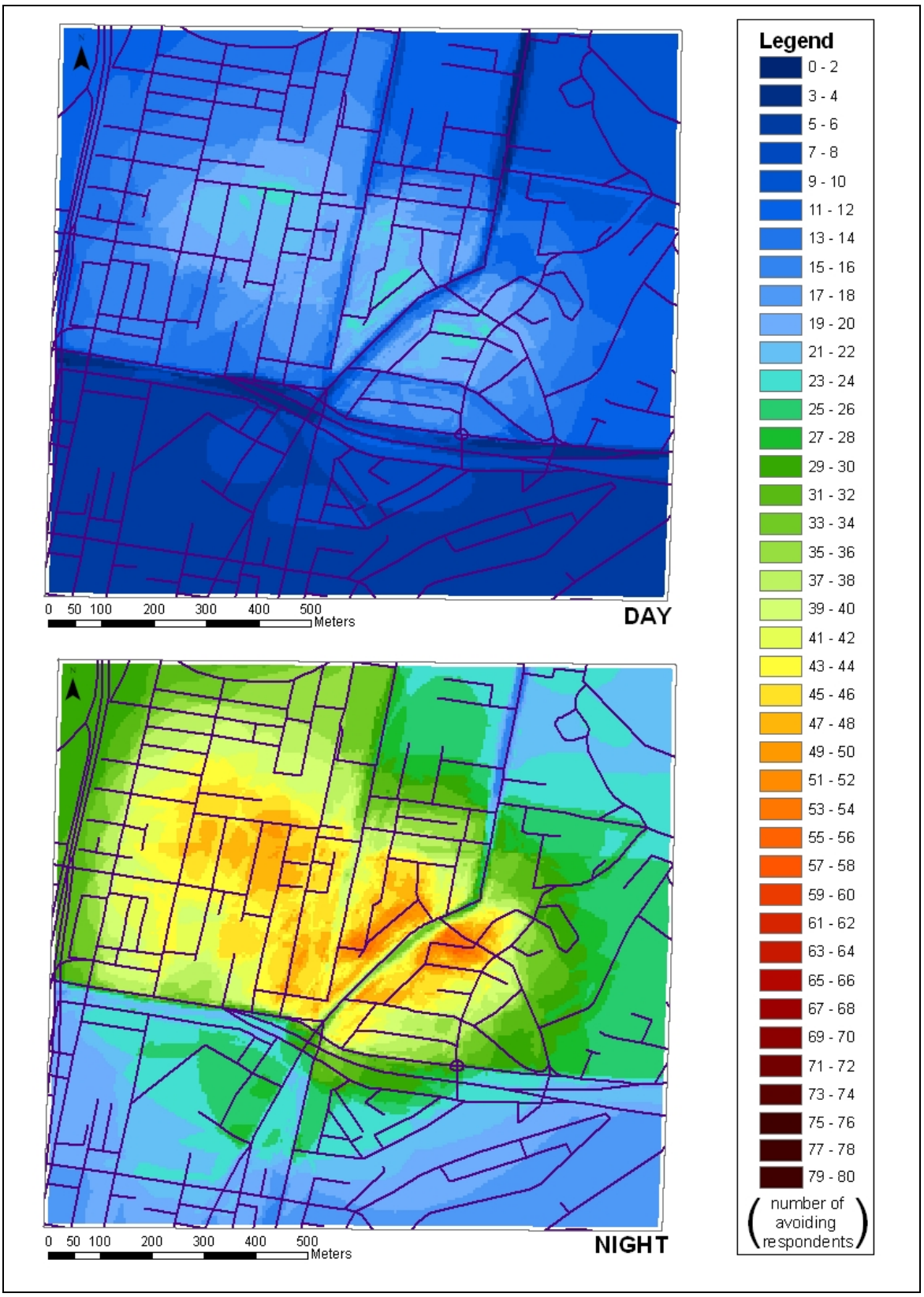


Figure 141. Areas where the survey respondents stated that the presence of AREAS TO HIDE triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

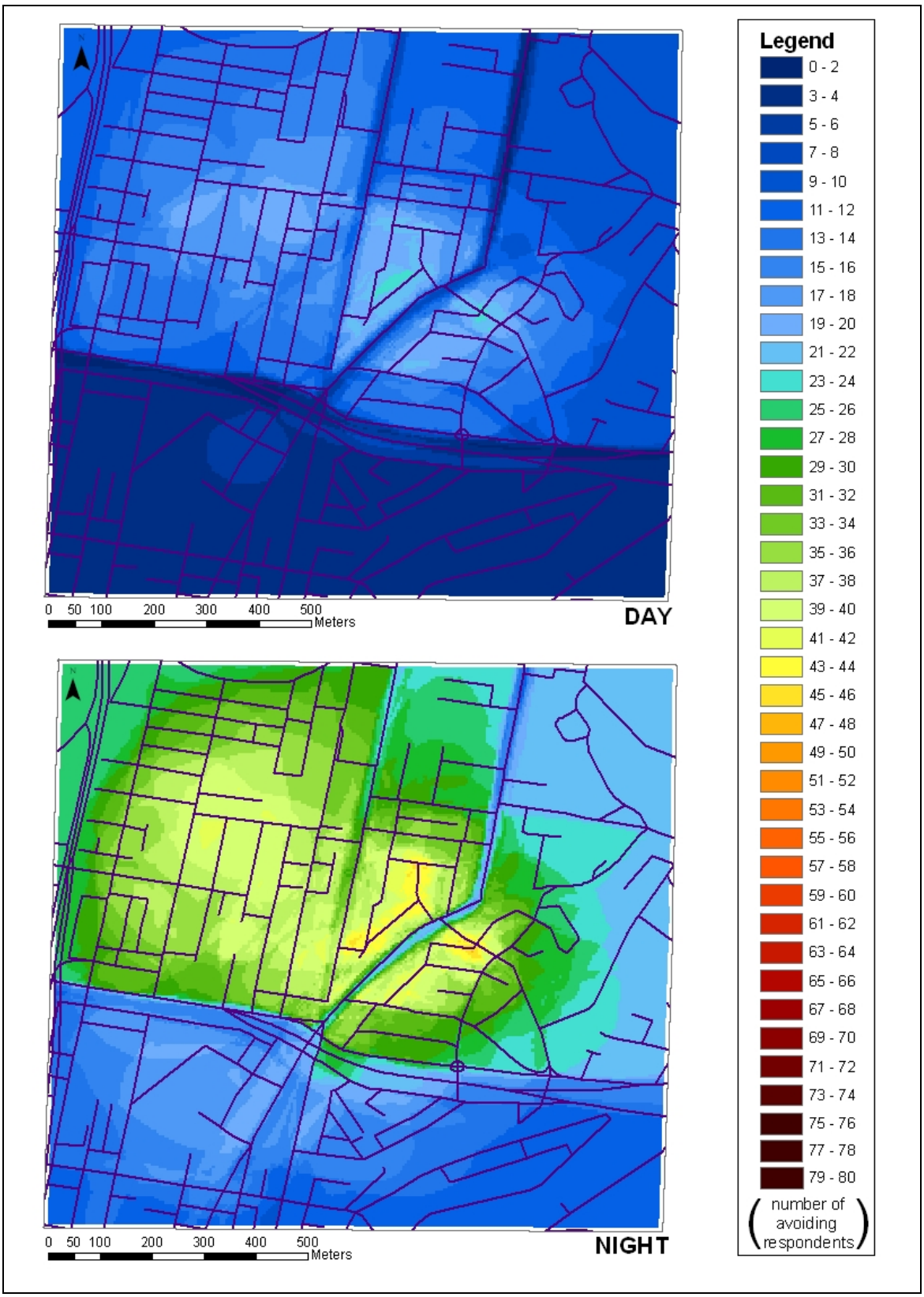


Figure 142. Areas where the survey respondents stated that the presence of BLOCKED ESCAPE triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

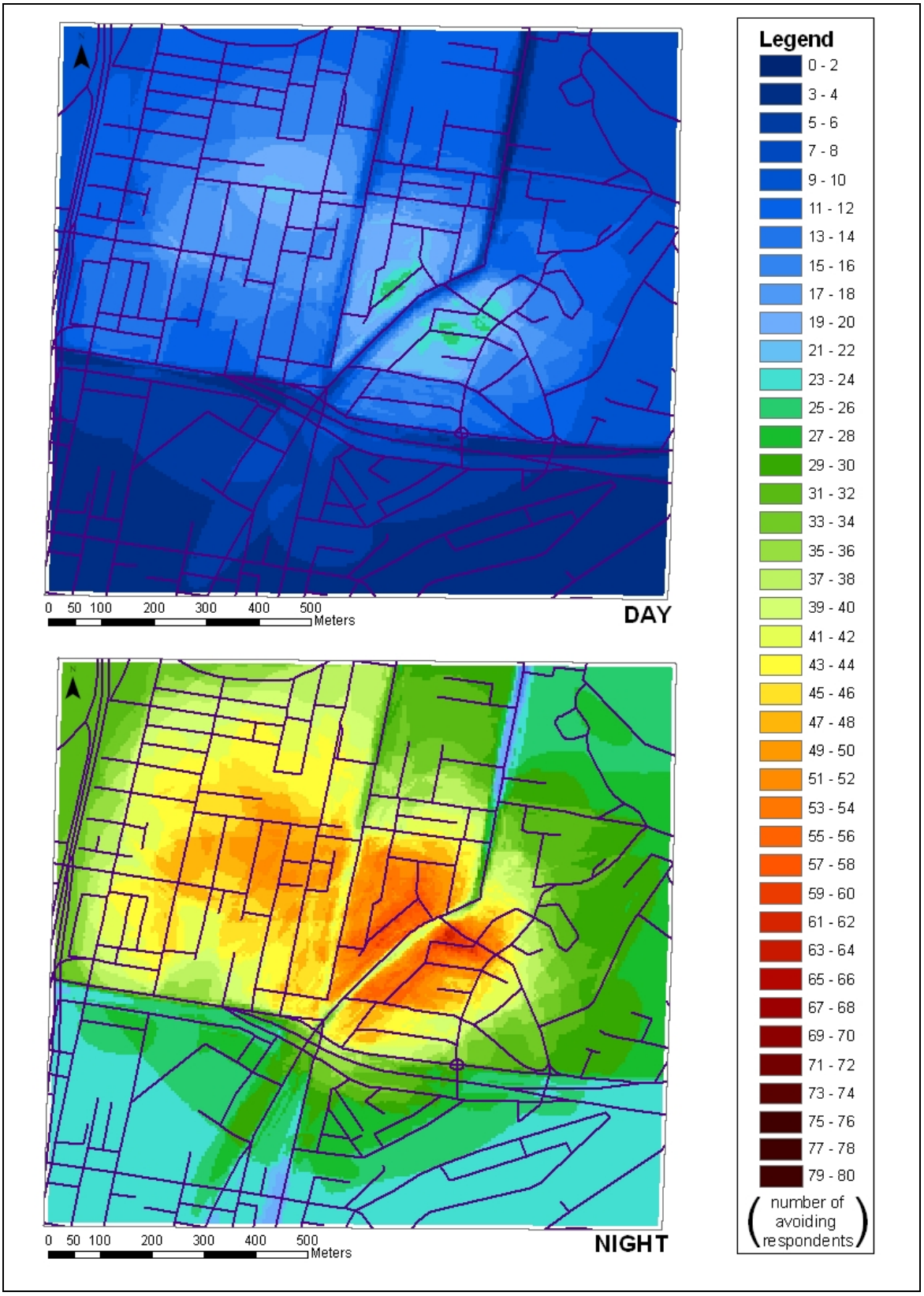


Figure 143. Areas where the survey respondents stated that the presence of LANEWAYS triggered their fear of being robbed, beaten or attacked – during the day and night. Aggregate population data for each area is categorised into classes of two.

15.4. Avoidance density maps used to identify areal differences in avoidance

The method of data classification used in these ‘avoidance density’ maps was employed identify areal differences in the patterns of avoidance triggered by each environmental cue.

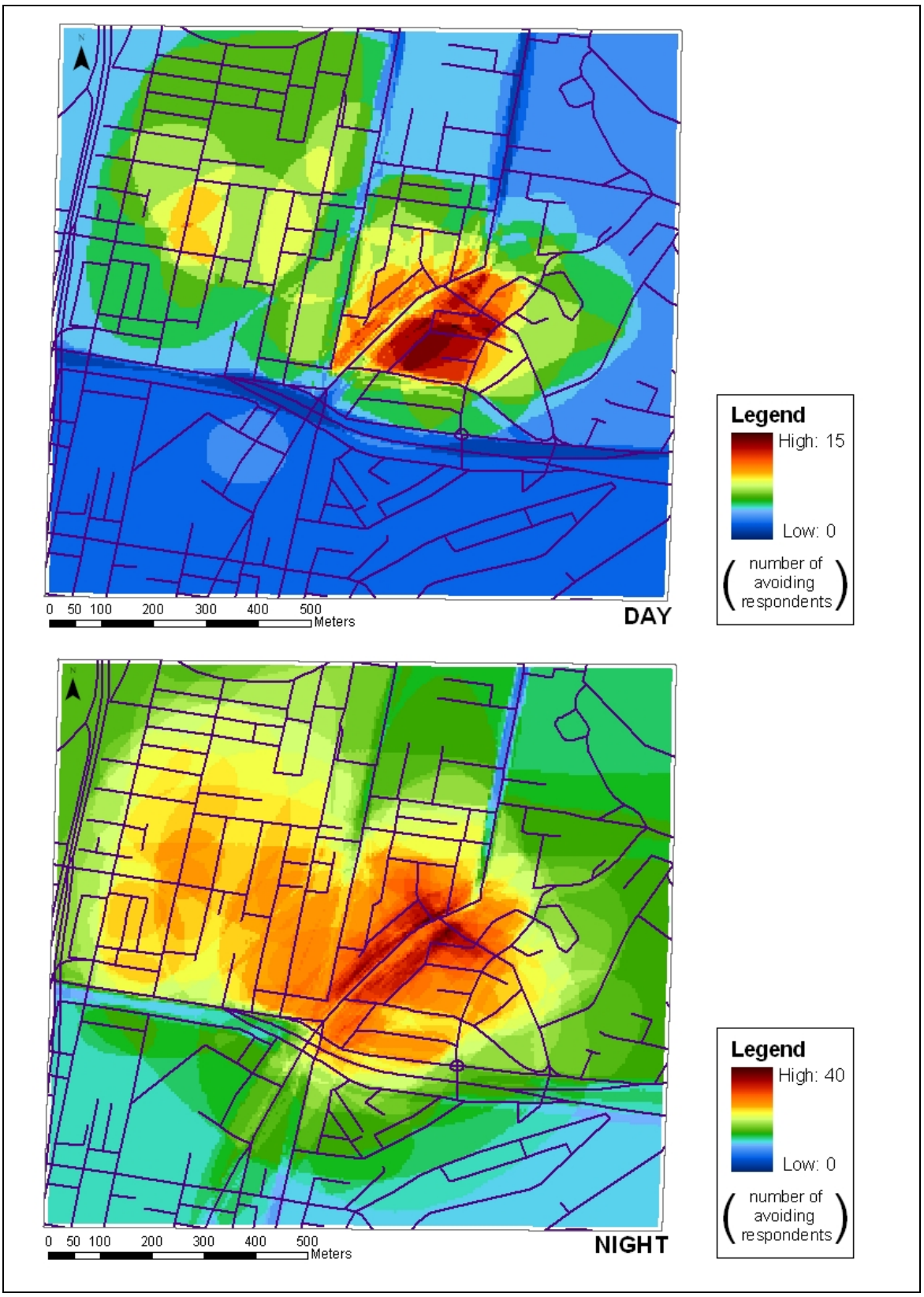


Figure 144. Areas where the survey respondents stated that the presence of SPRUIKERS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

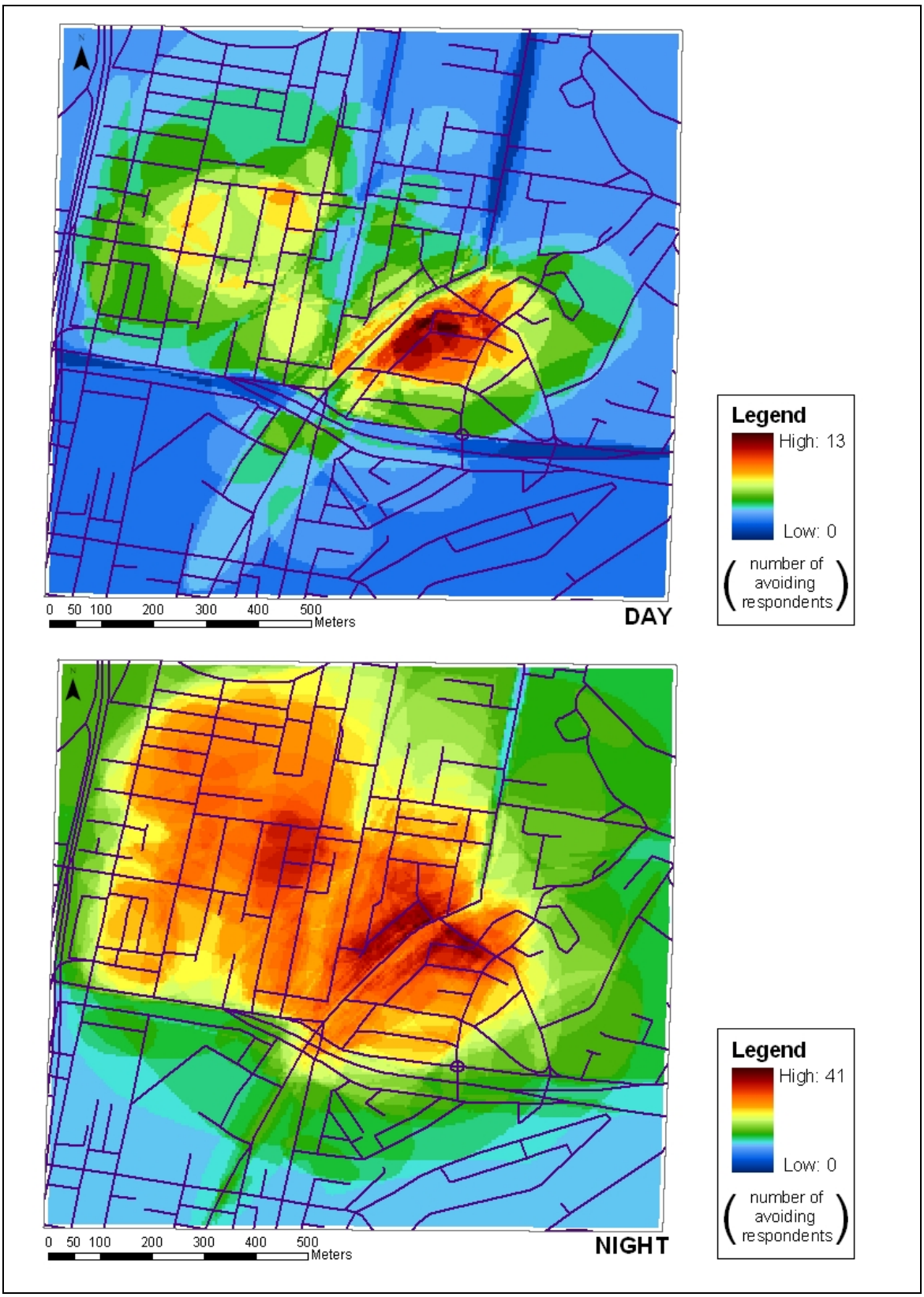


Figure 145. Areas where the survey respondents stated that the presence of HOMELESS people triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

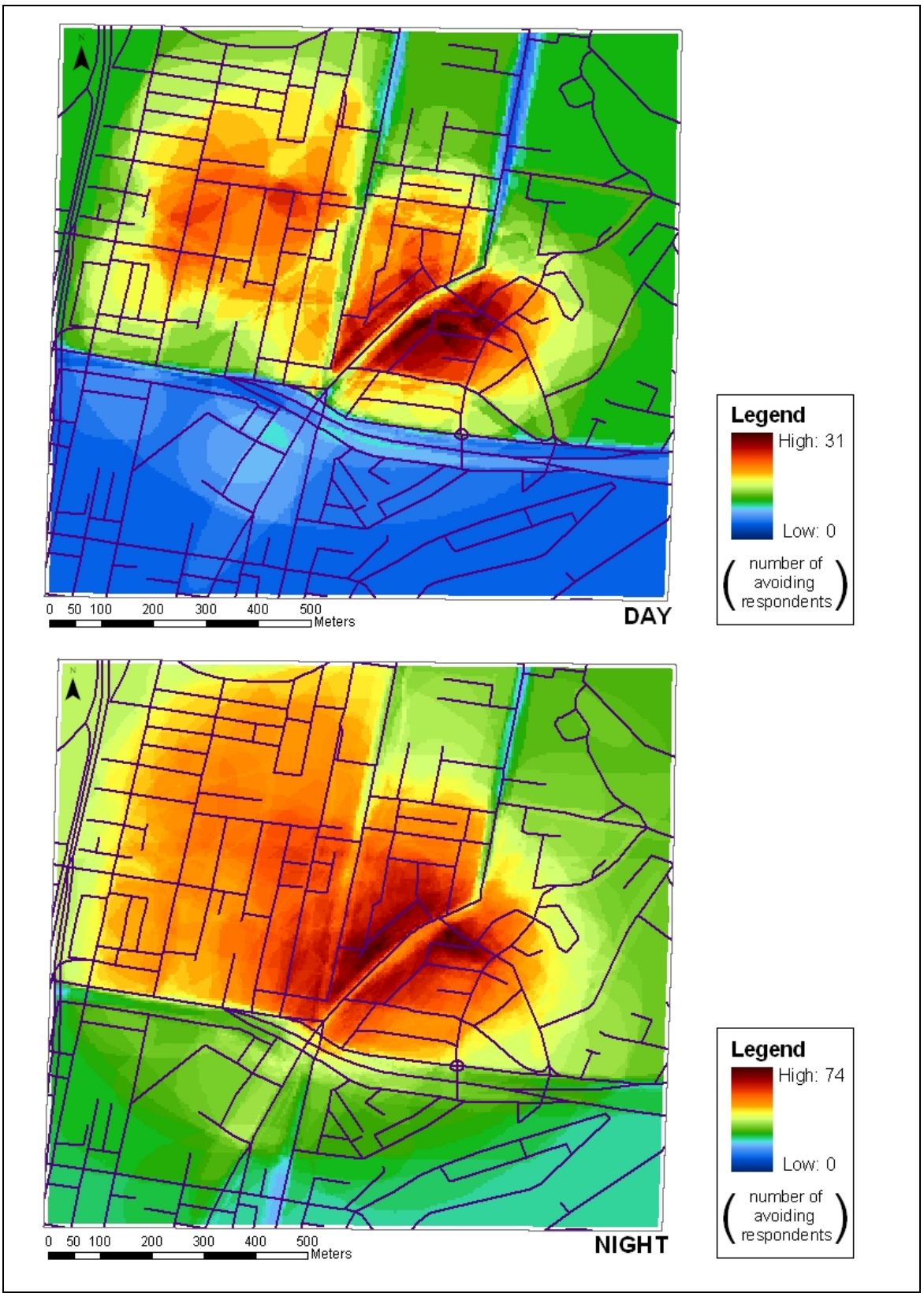


Figure 146. Areas where the survey respondents stated that the presence of INTOXICATED PERSONS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

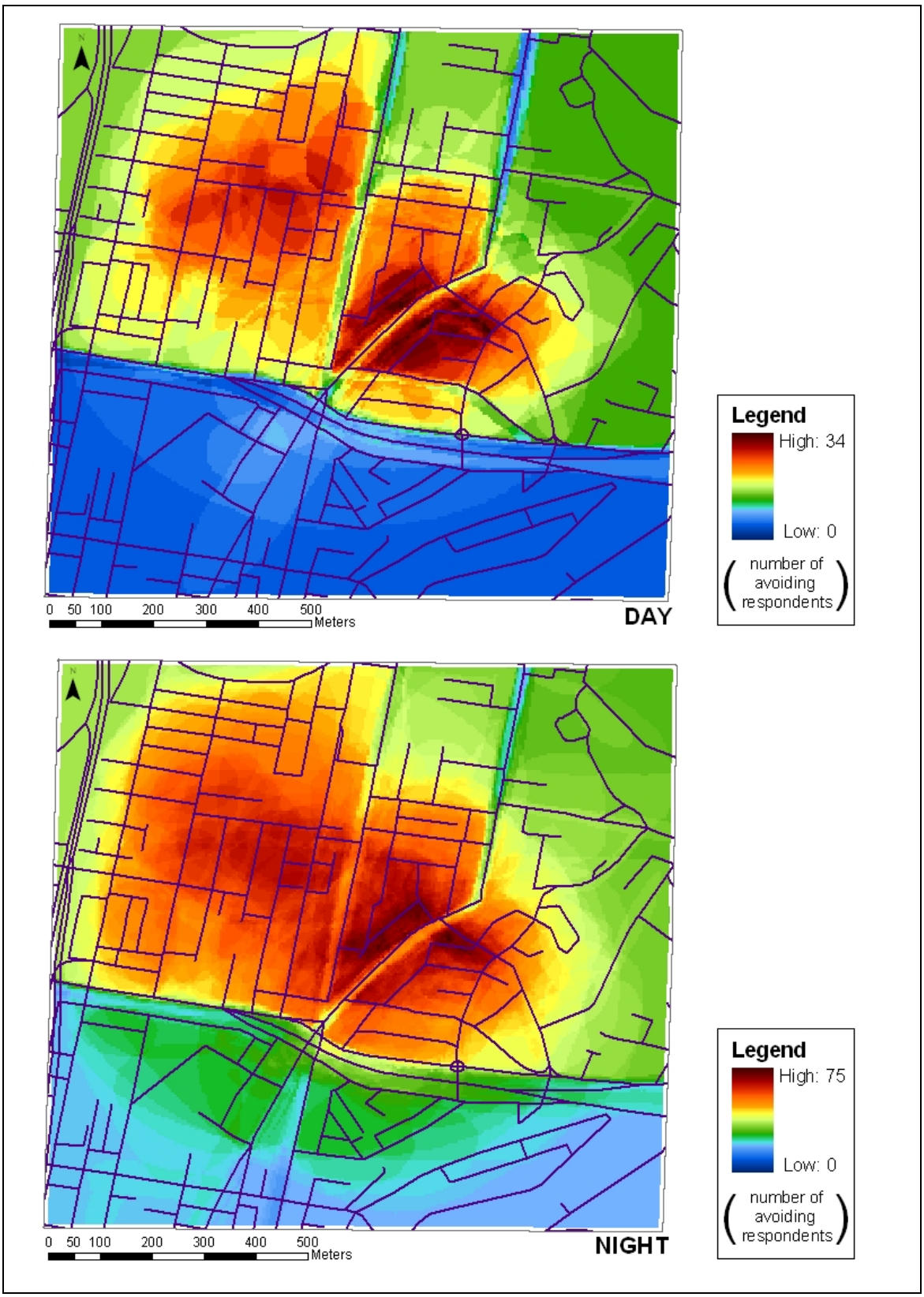


Figure 147. Areas where the survey respondents stated that the presence of GANGS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

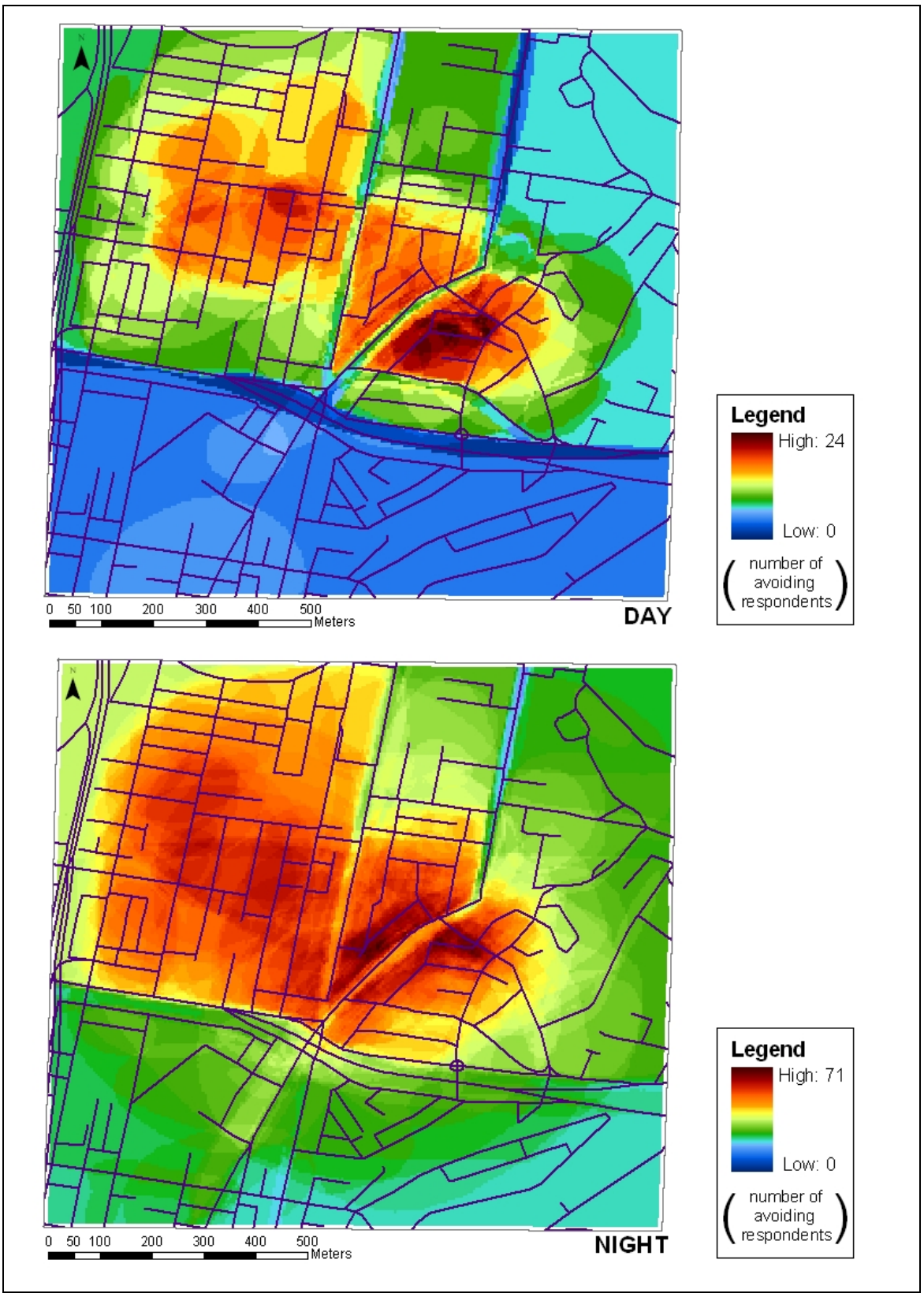


Figure 148. Areas where the survey respondents stated that the presence of LOITERING PEOPLE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

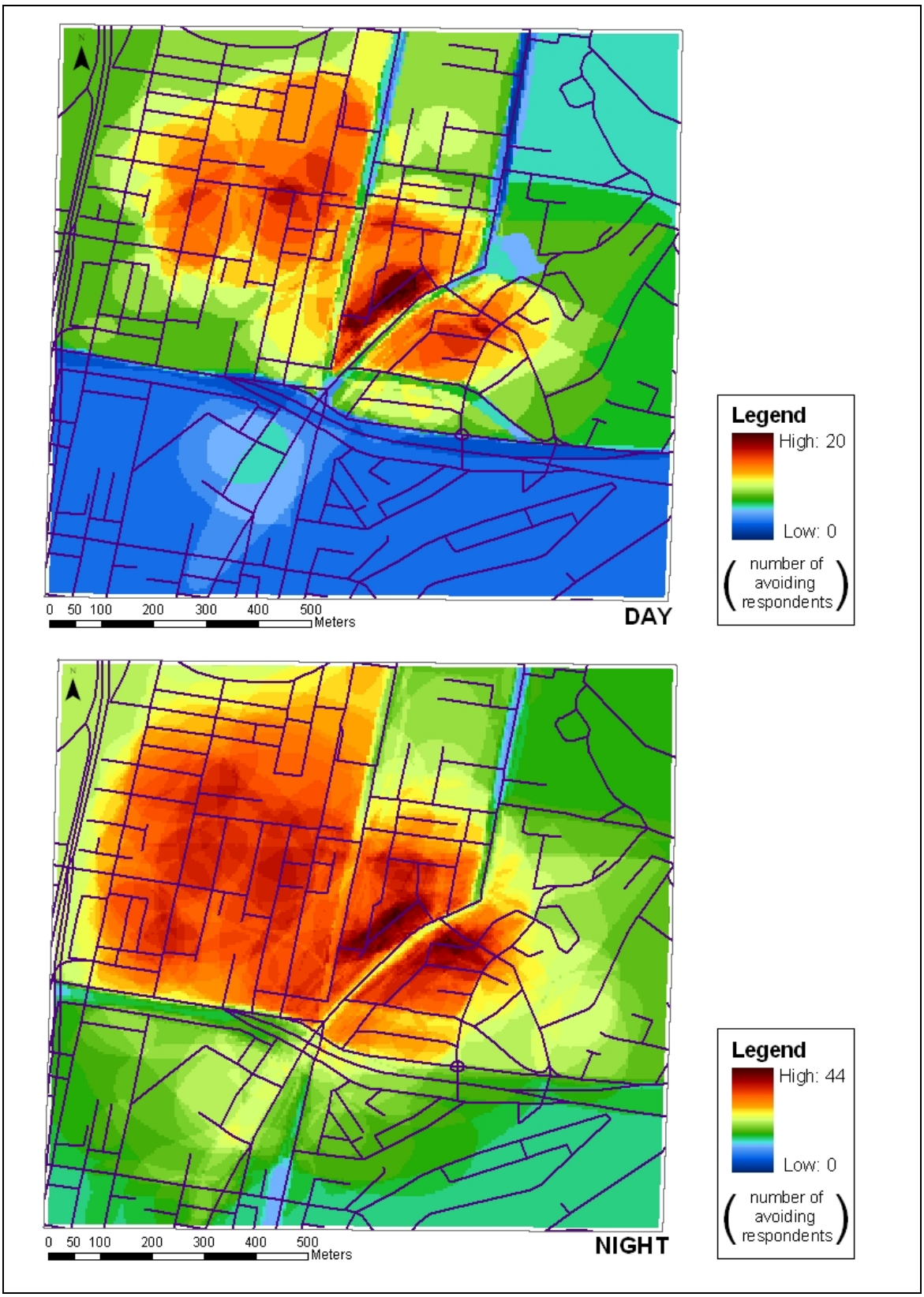


Figure 149. Areas where the survey respondents stated PEDESTRIAN ABSENCE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

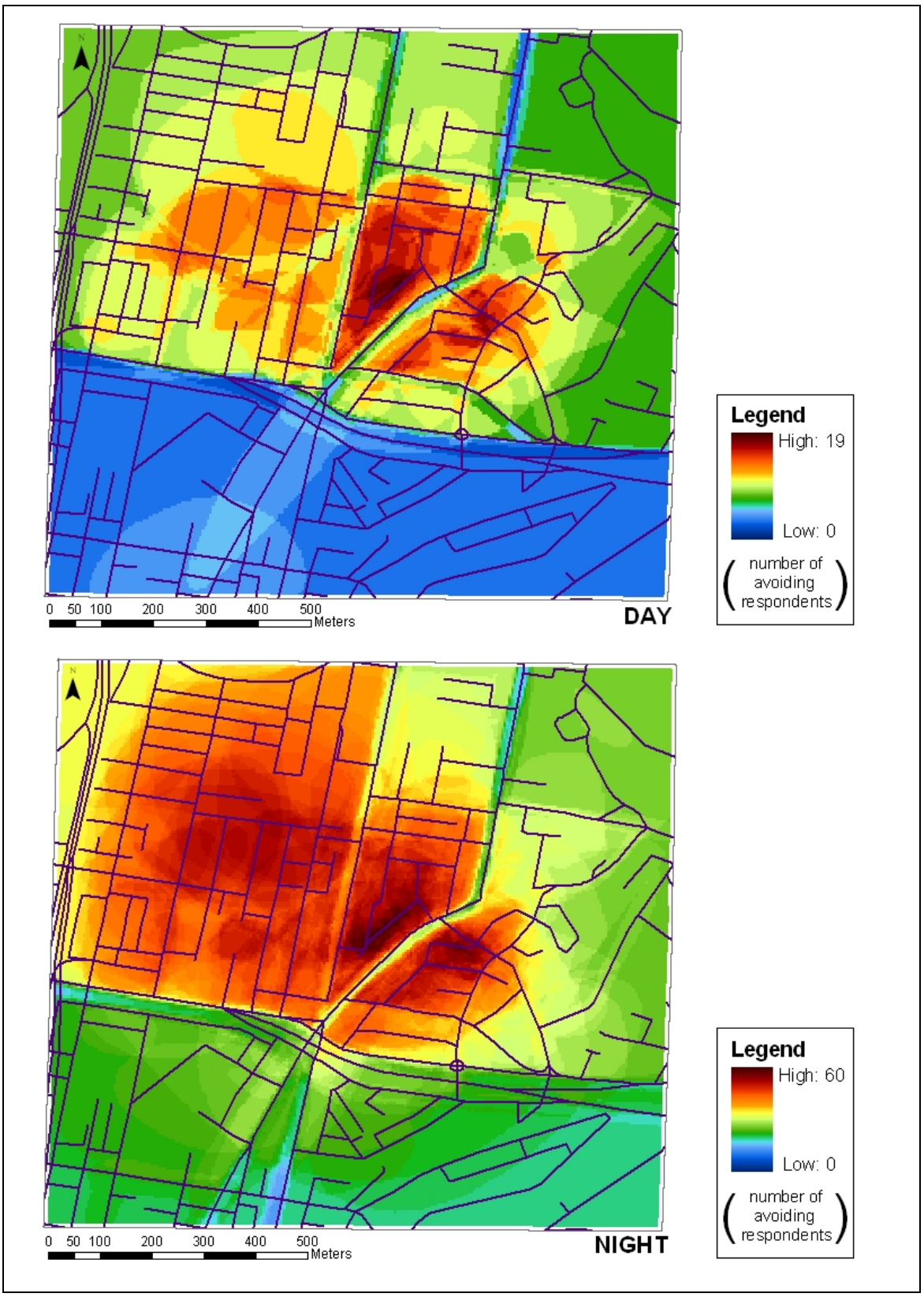


Figure 150. Areas where the survey respondents stated POOR STREET LIGHTING triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

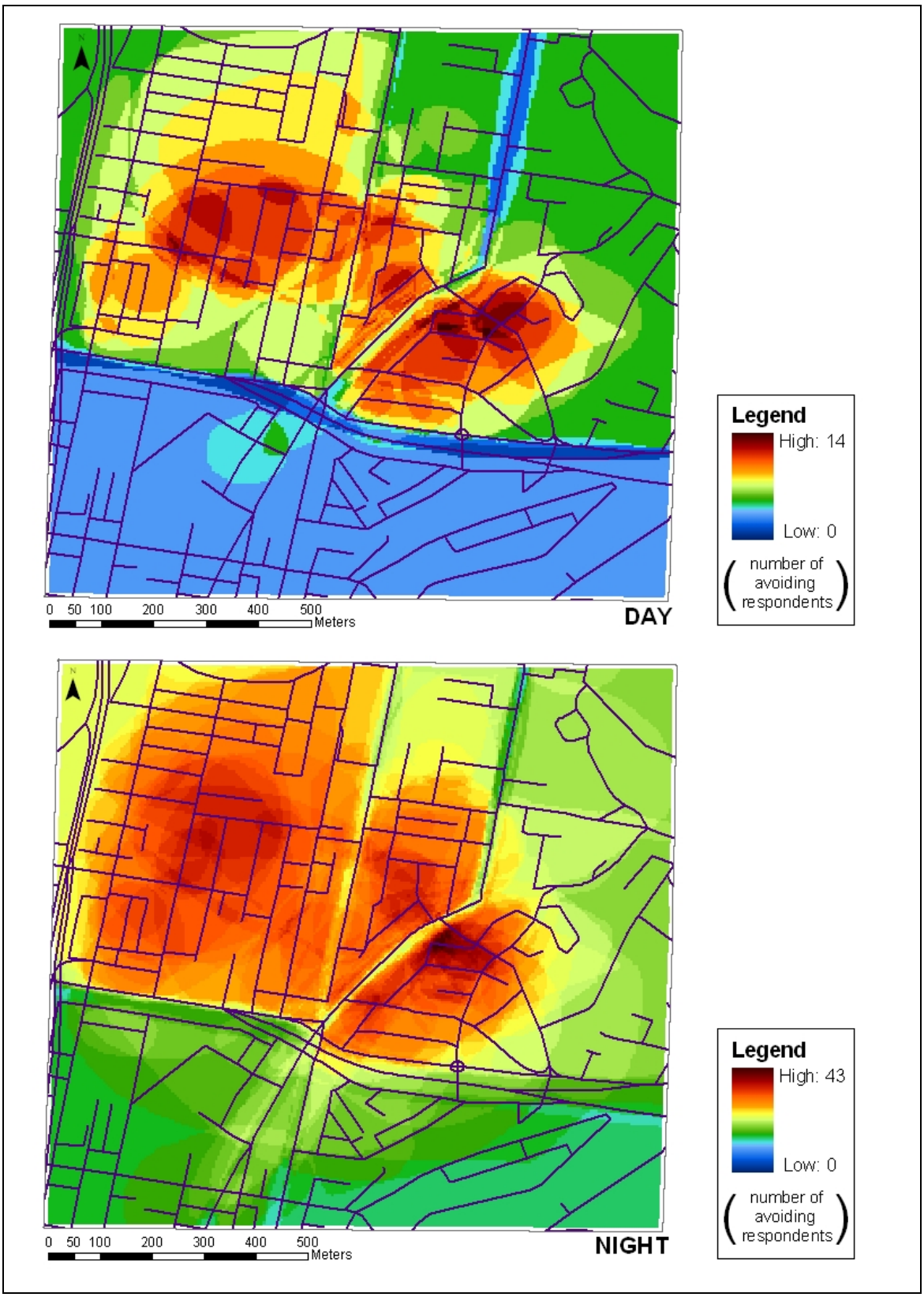


Figure 151. Areas where the survey respondents stated that the presence of VANDALISM triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

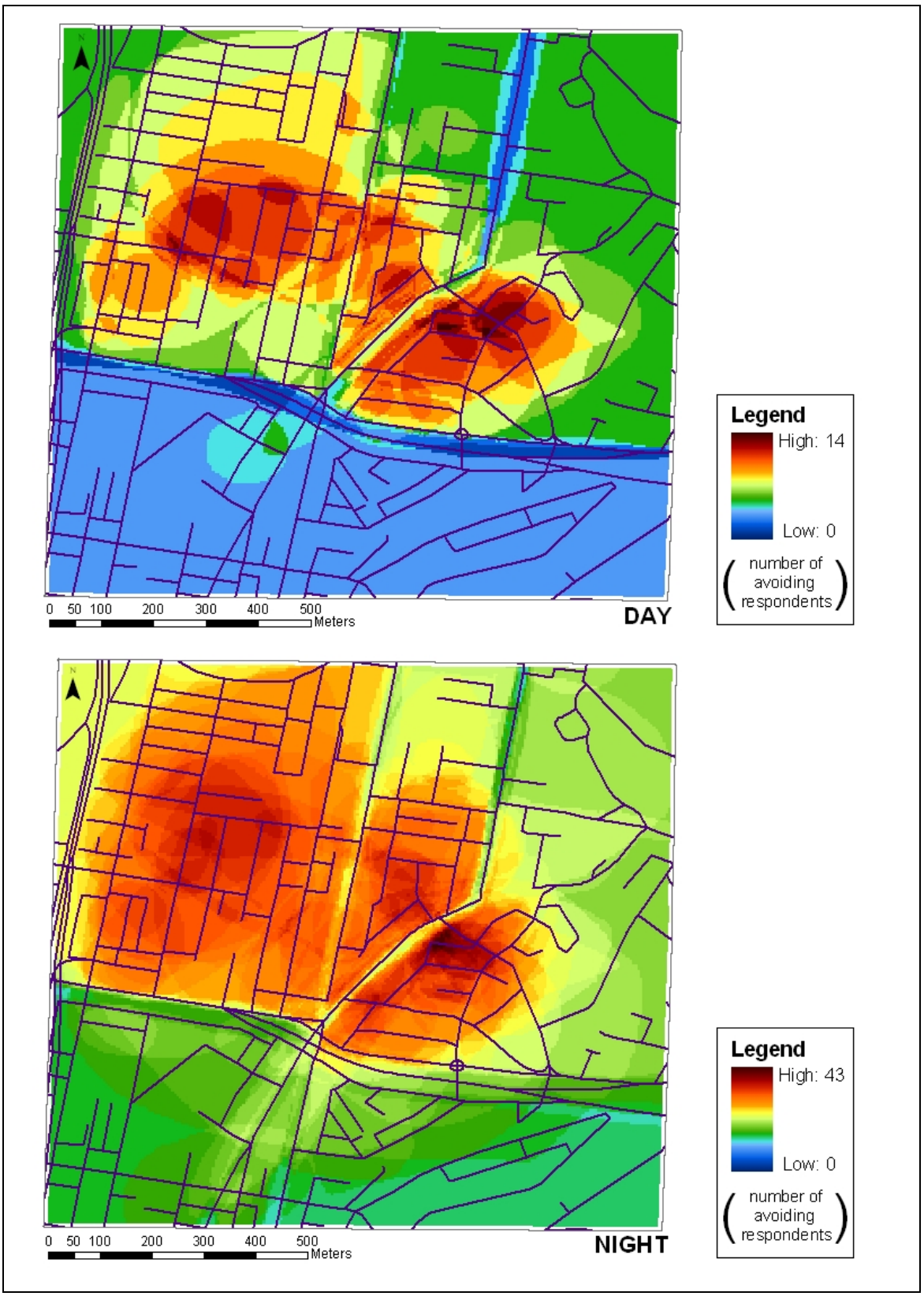


Figure 152. Areas where the survey respondents stated that the presence of RUBBISH / SYRINGES triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

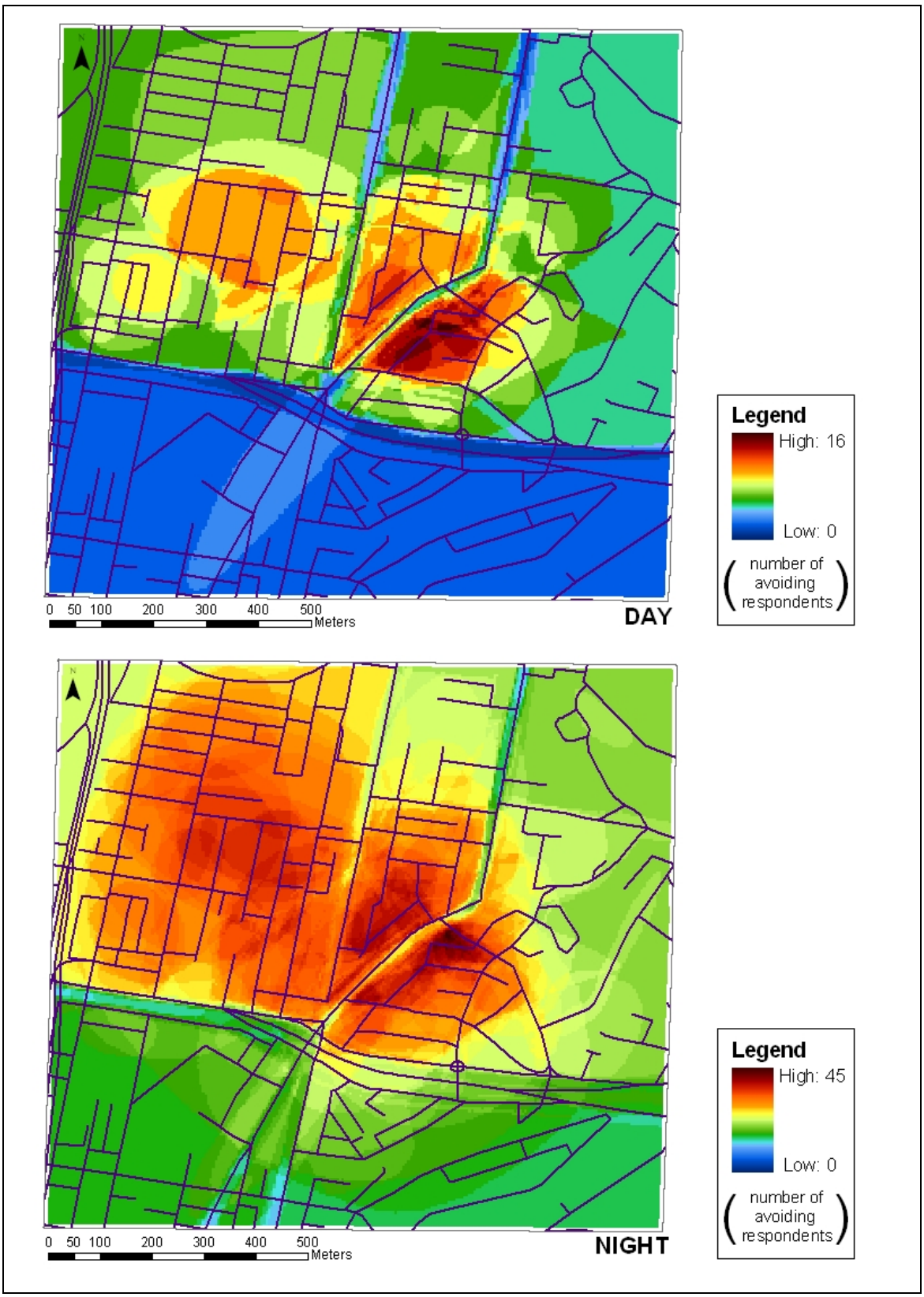


Figure 153. Areas where the survey respondents stated that the presence of RUNDOWN / ABANDONED BUILDINGS triggered their fear of being robbed, beaten or attacked – during the day night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

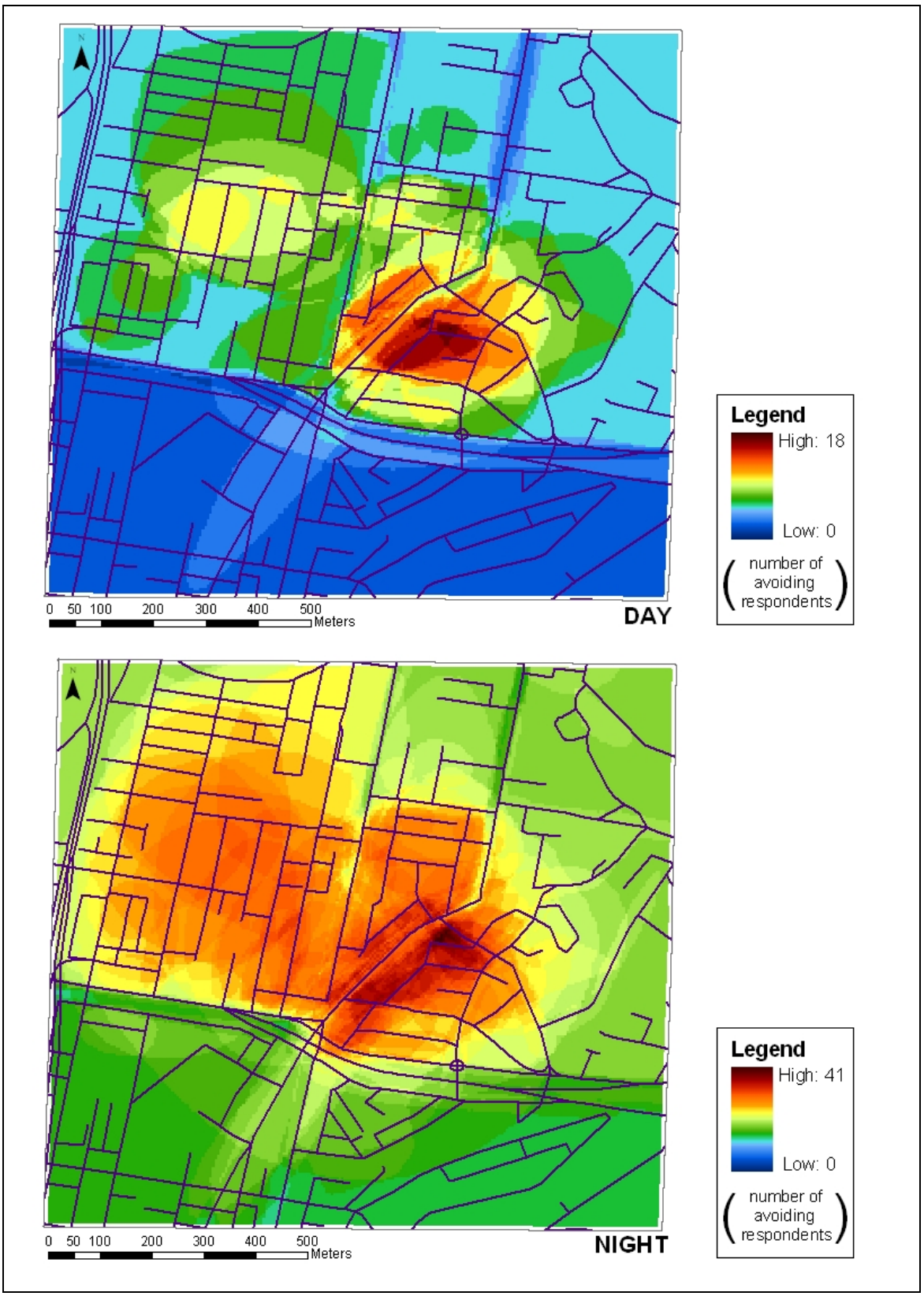


Figure 154. Areas where the survey respondents stated that the presence of OFFESIVE / DEGRADED SHOPS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

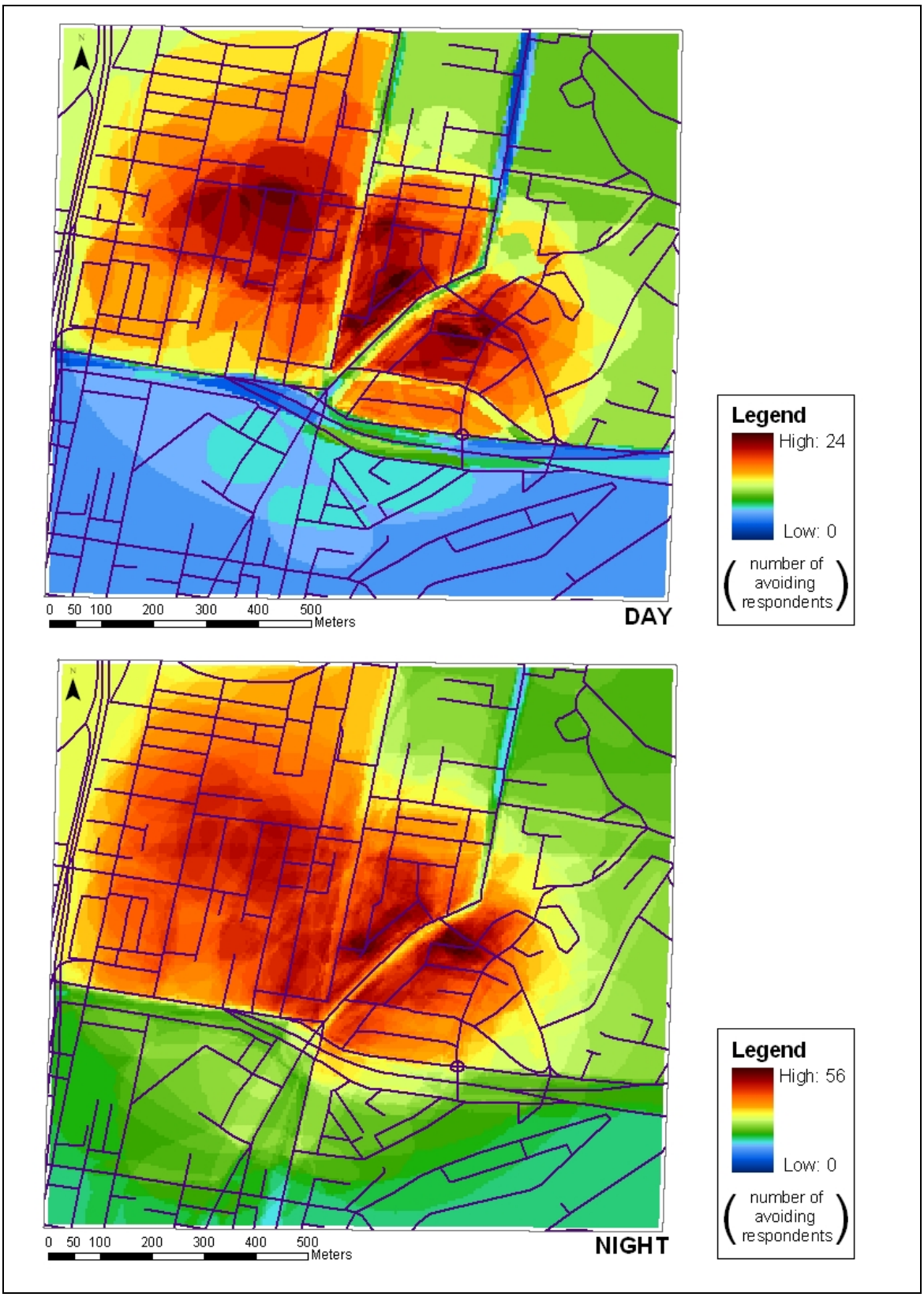


Figure 155. Areas where the survey respondents stated that the presence of AREAS TO HIDE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

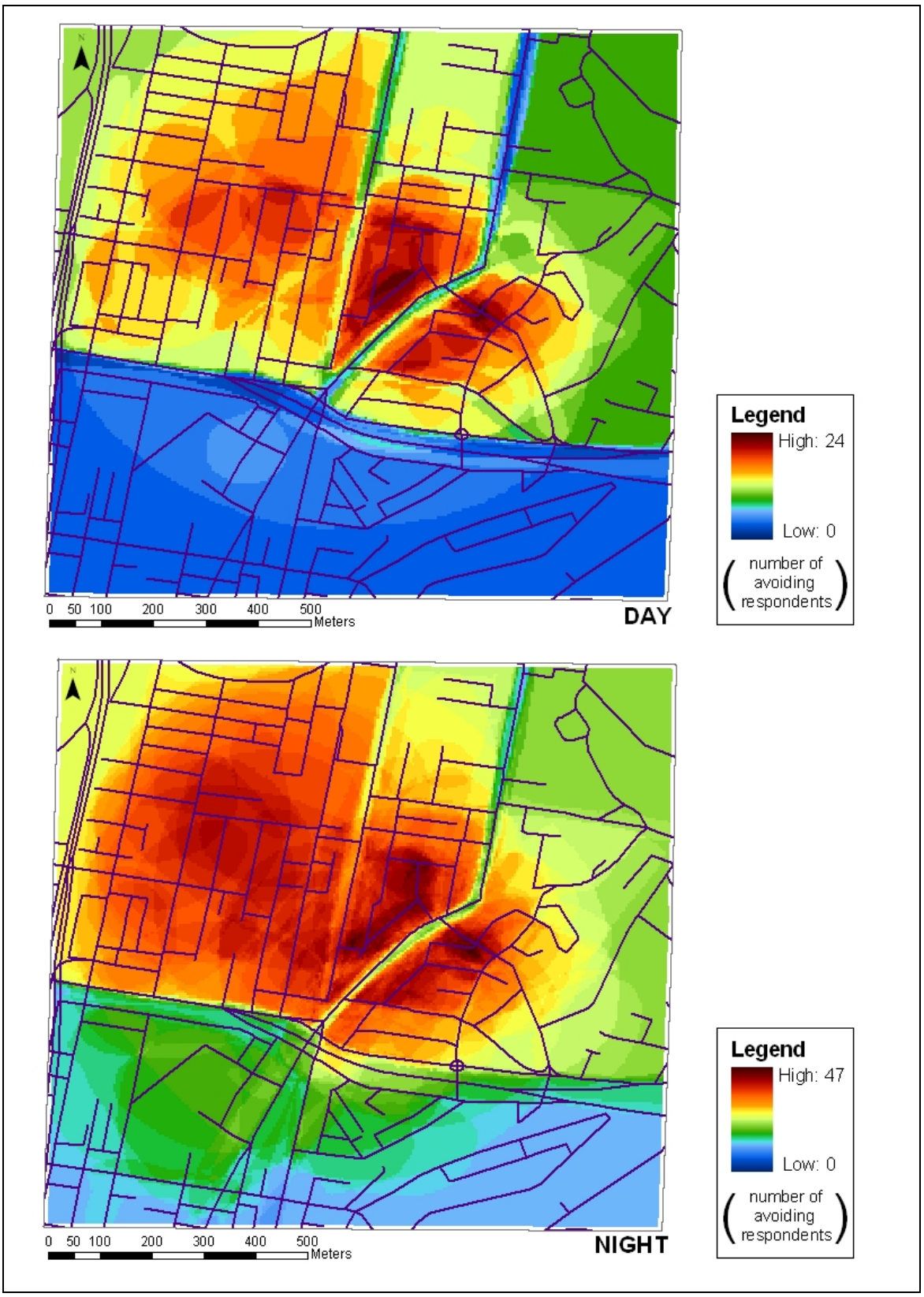


Figure 156. Areas where the survey respondents stated that the presence of BLOCKED ESCAPE triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

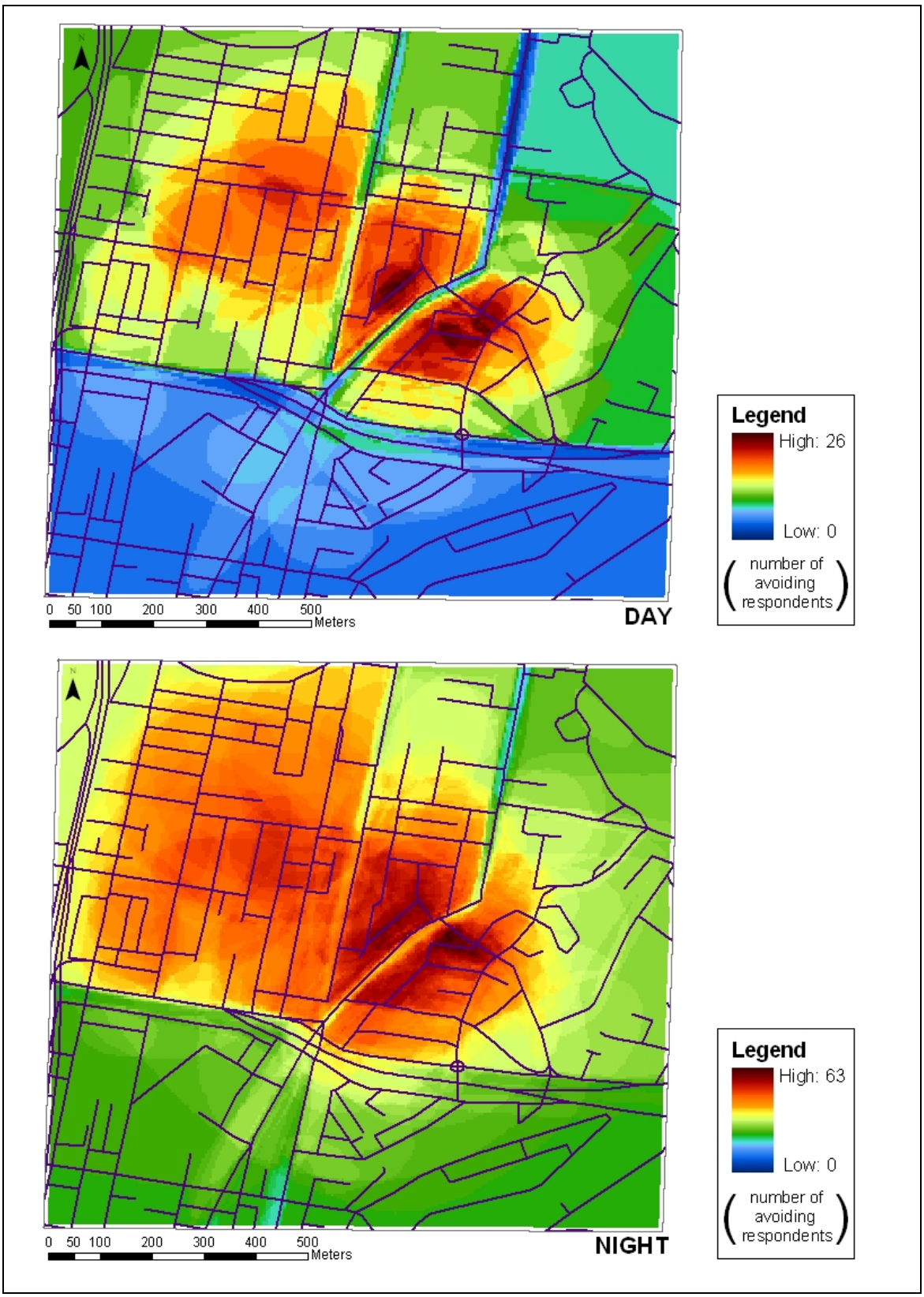


Figure 157. Areas where the survey respondents stated that the presence of LANEWAYS triggered their fear of being robbed, beaten or attacked – during the day and night. The aggregate avoidance data is displayed using a colour ramp with a minimum of zero and a maximum equaling the true maximum value in the data.

15.5. Avoidance Hardness maps

The maps in this appendix show the average avoidance hardness for areas where the survey respondents stated the different environmental cues triggered their fear of being robbed, beaten or attacked – during the day and night.

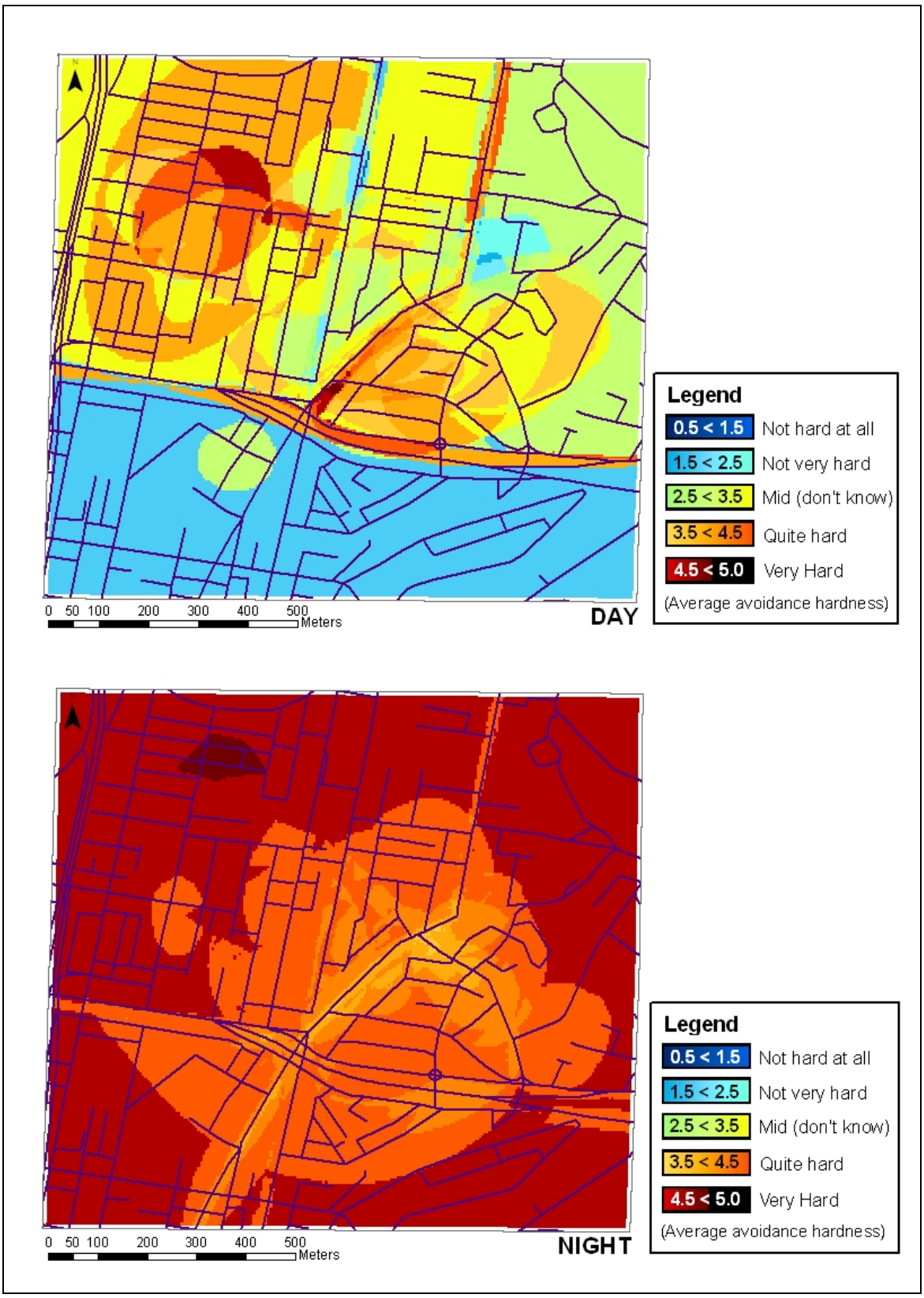


Figure 158. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of SPRUIKERS triggered their fear of being robbed, beaten or attacked – during the day and night.

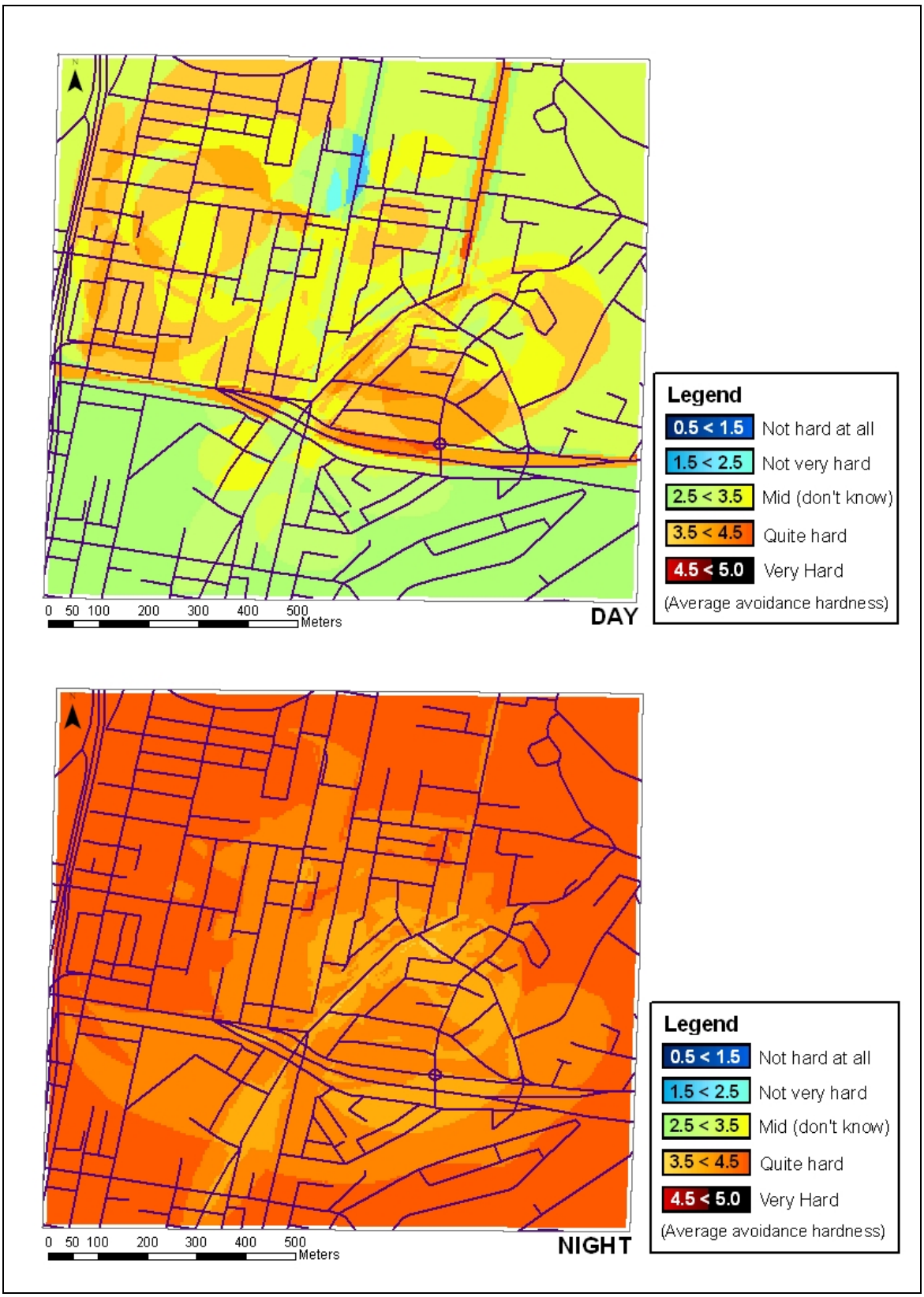


Figure 159. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of HOMELESS people triggered their fear of being robbed, beaten or attacked – during the day and night.

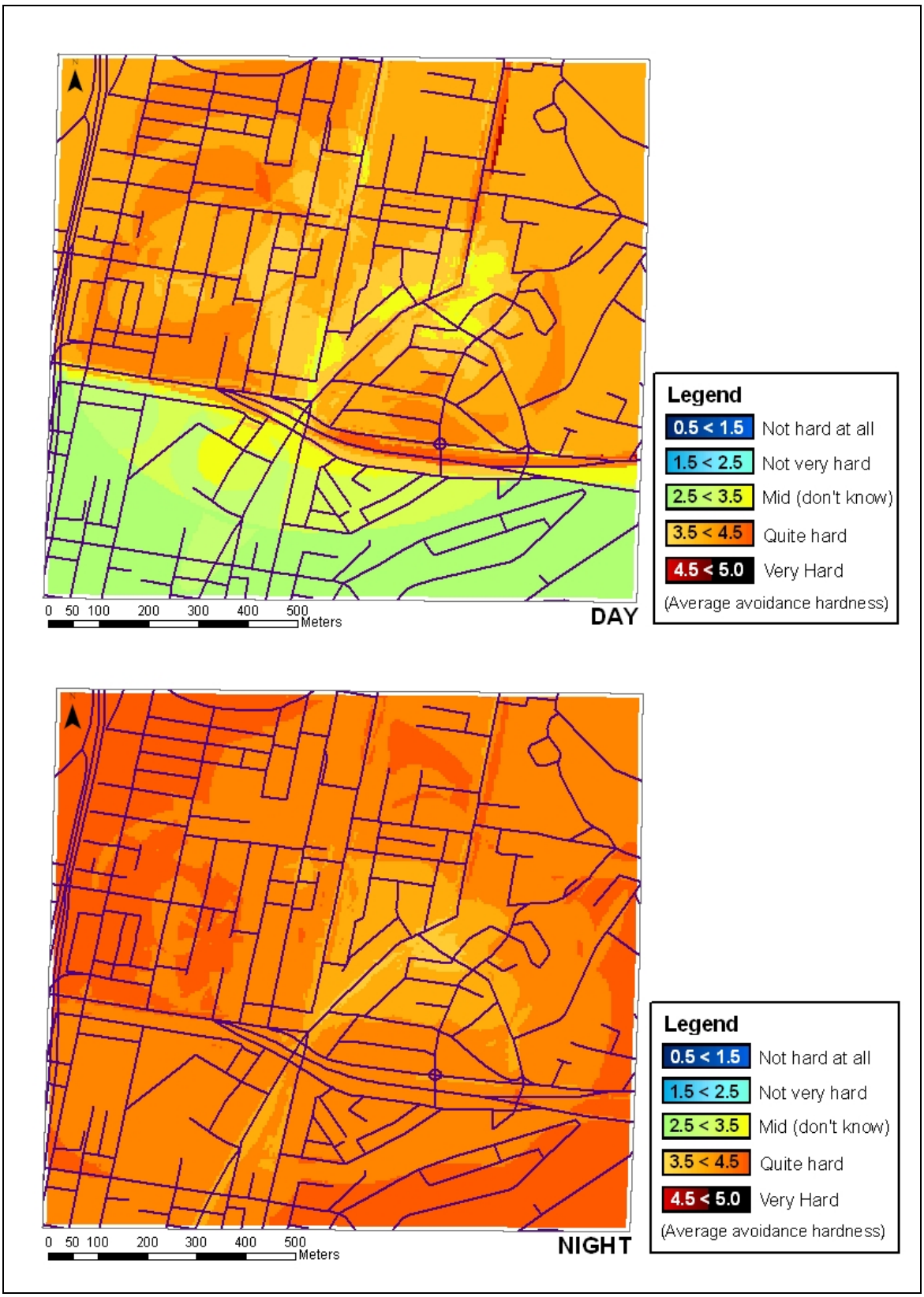


Figure 160. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of INTOXICATED PERSONS triggered their fear of being robbed, beaten or attacked – during the day and night.

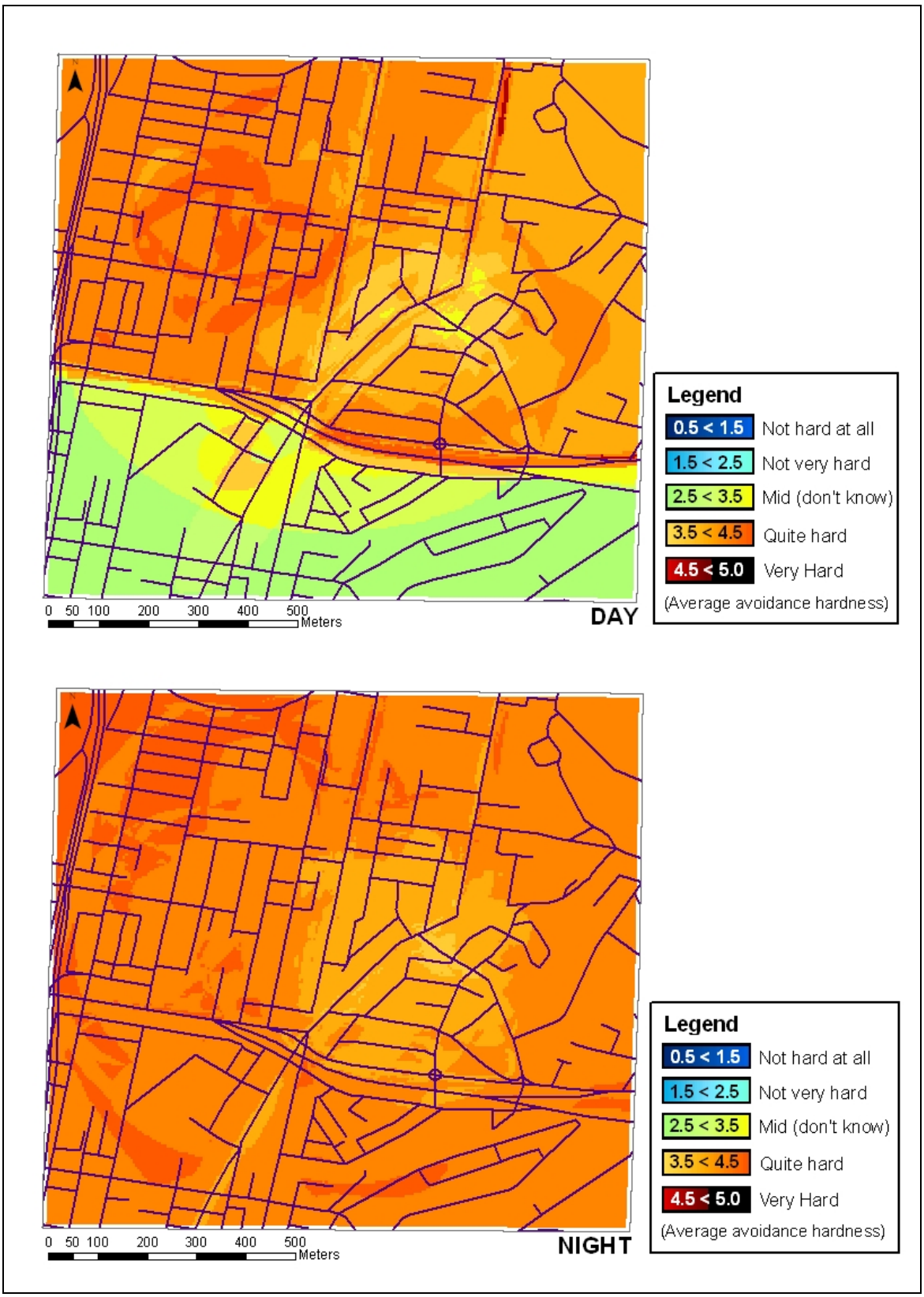


Figure 161. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of GANGS triggered their fear of being robbed, beaten or attacked – during the day and night.

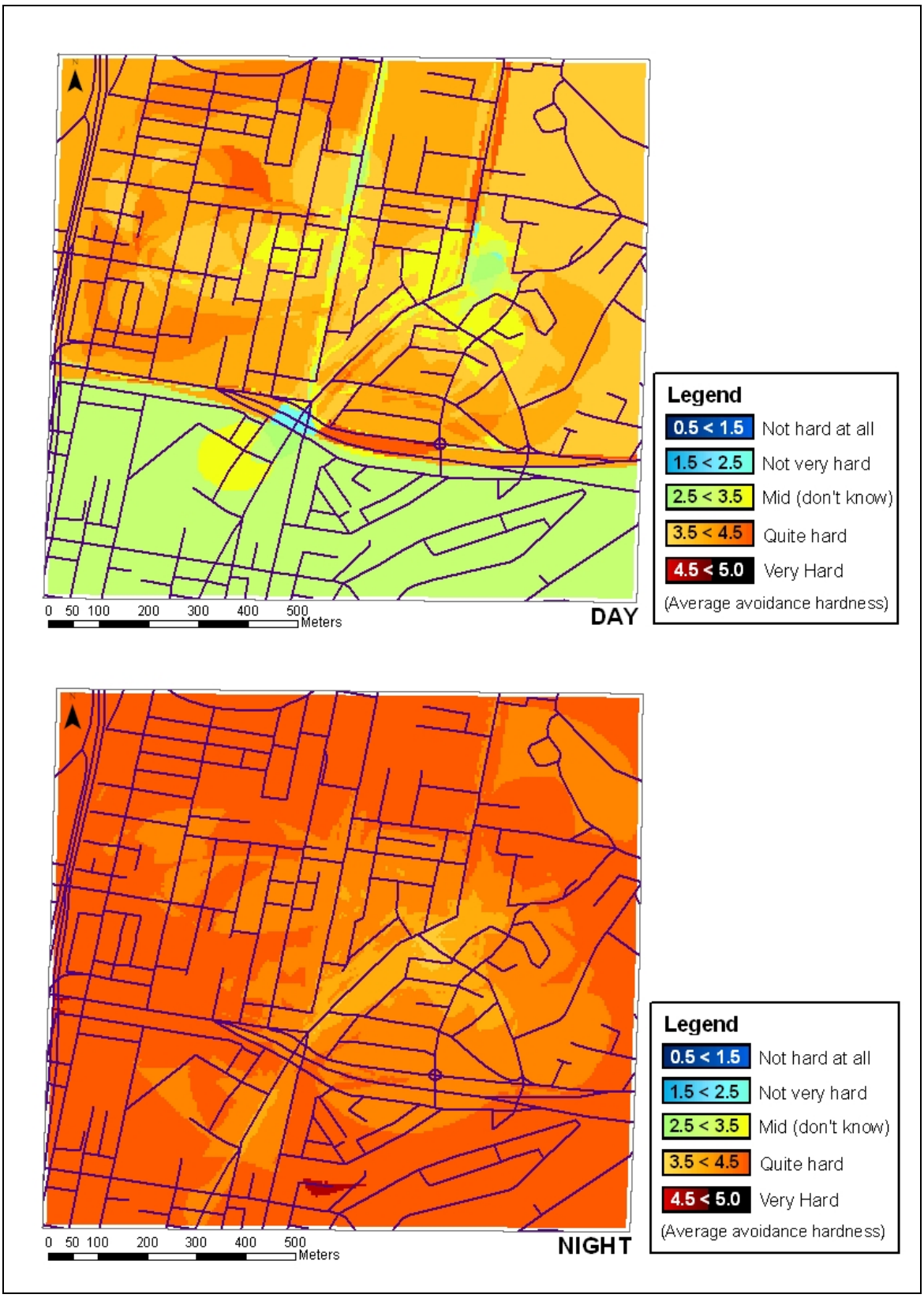


Figure 162. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of LOITERING PEOPLE triggered their fear of being robbed, beaten or attacked – during the day and night.

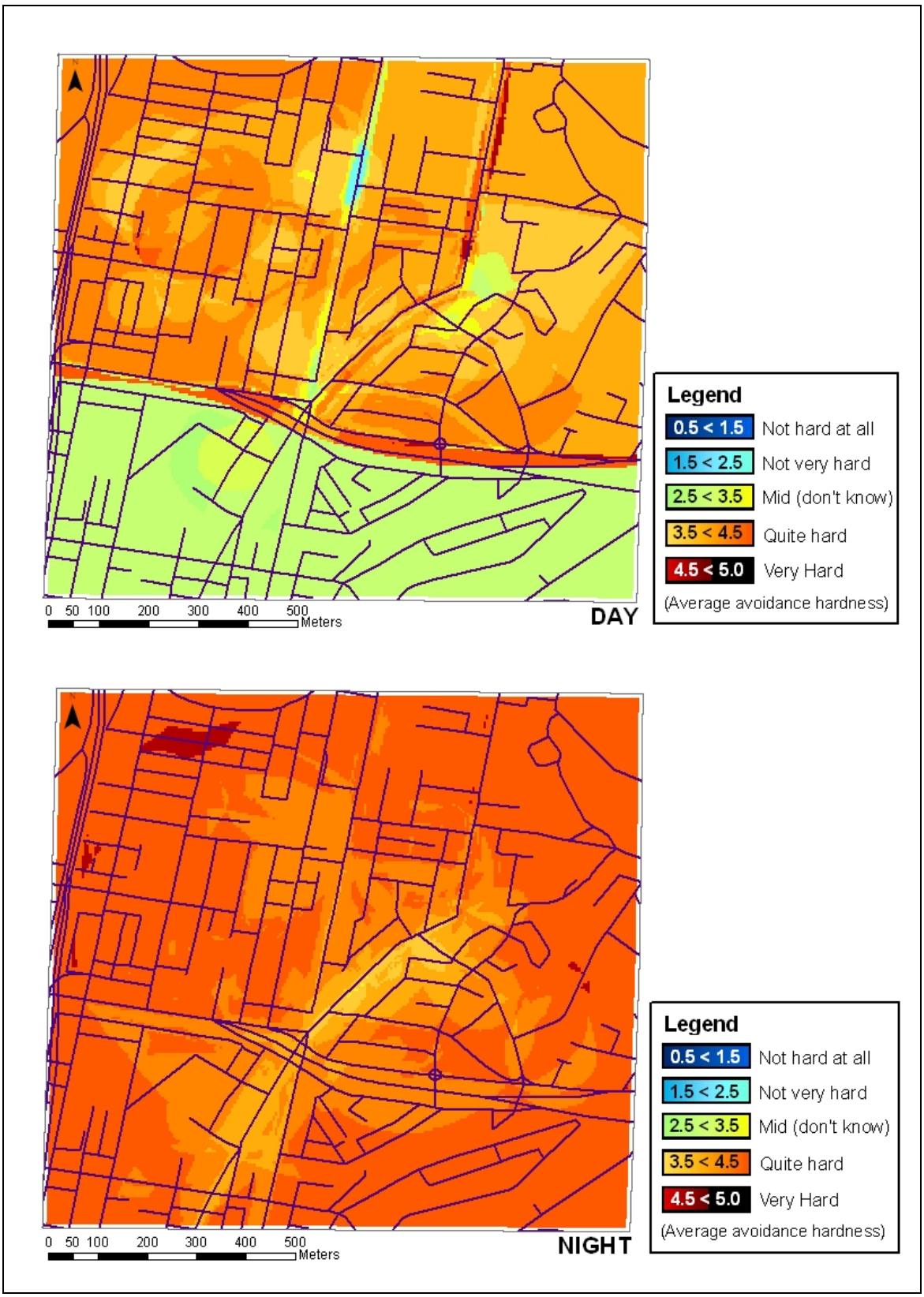


Figure 163. Average degree of avoidance hardness for areas where the survey respondents stated PEDESTRIAN ABSENCE triggered their fear of being robbed, beaten or attacked – during the day and night.

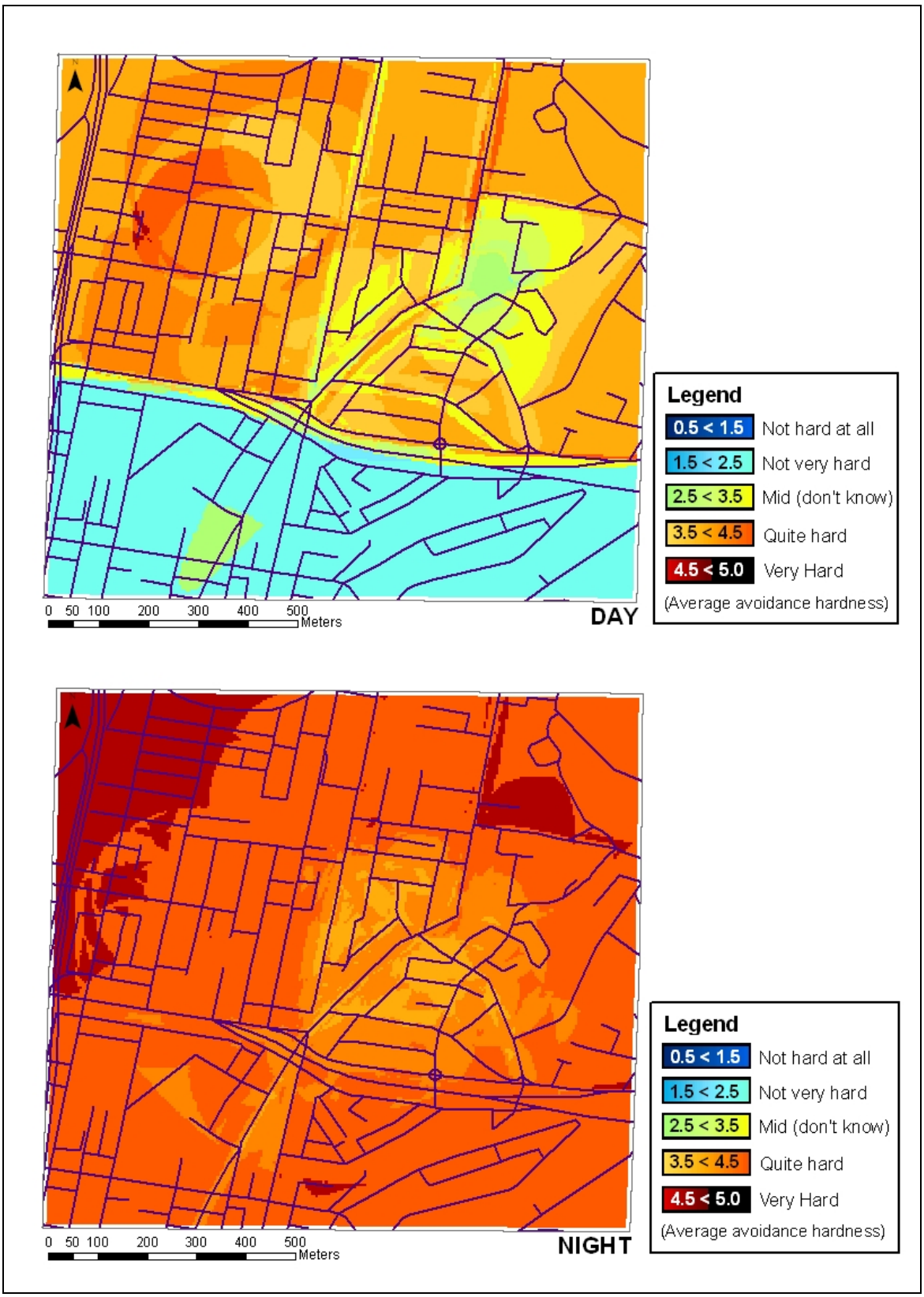


Figure 164. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of POOR STREET LIGHTING triggered their fear of being robbed, beaten or attacked – during the day and night.

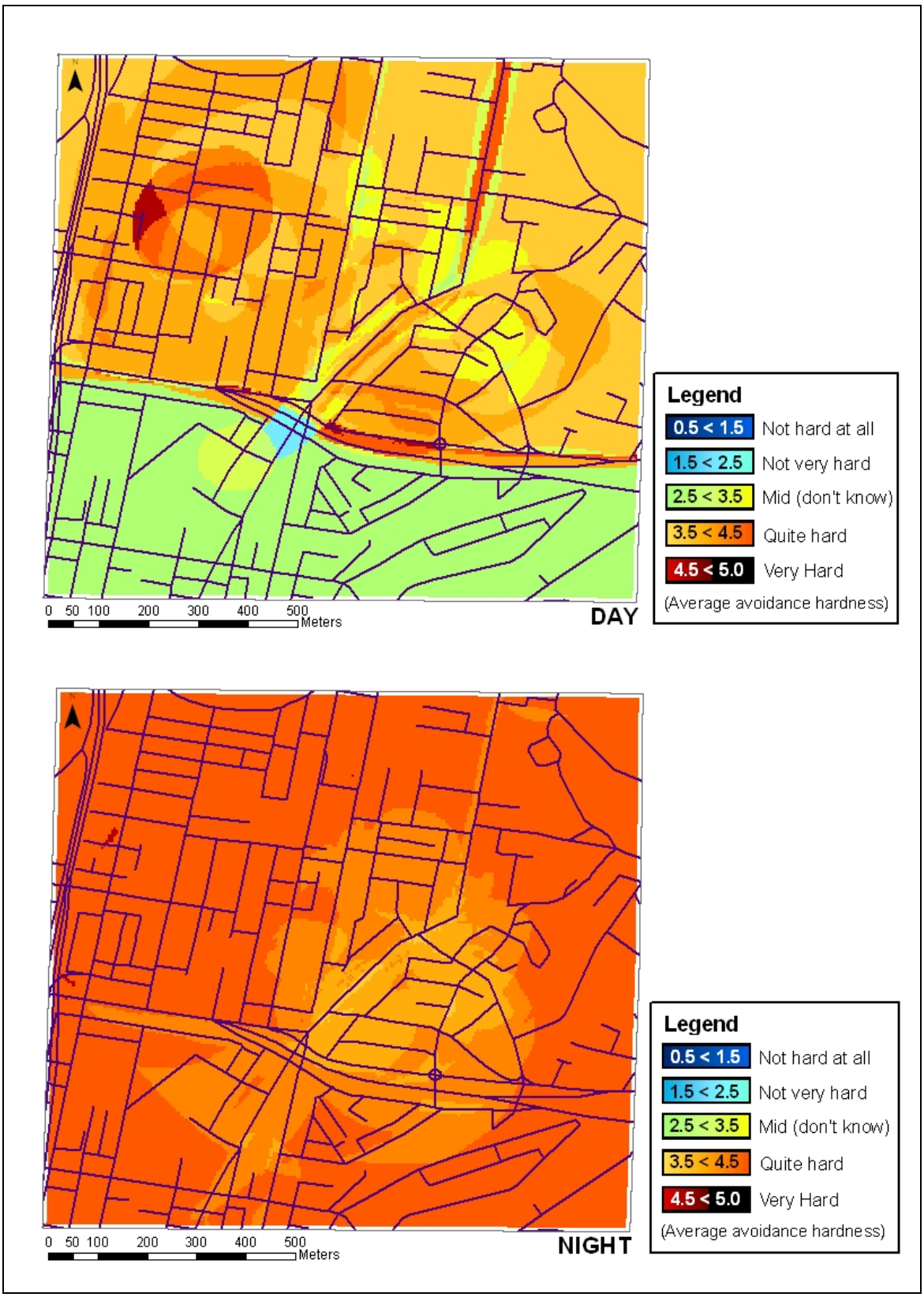


Figure 165. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of VANDALISM triggered their fear of being robbed, beaten or attacked – during the day and night.

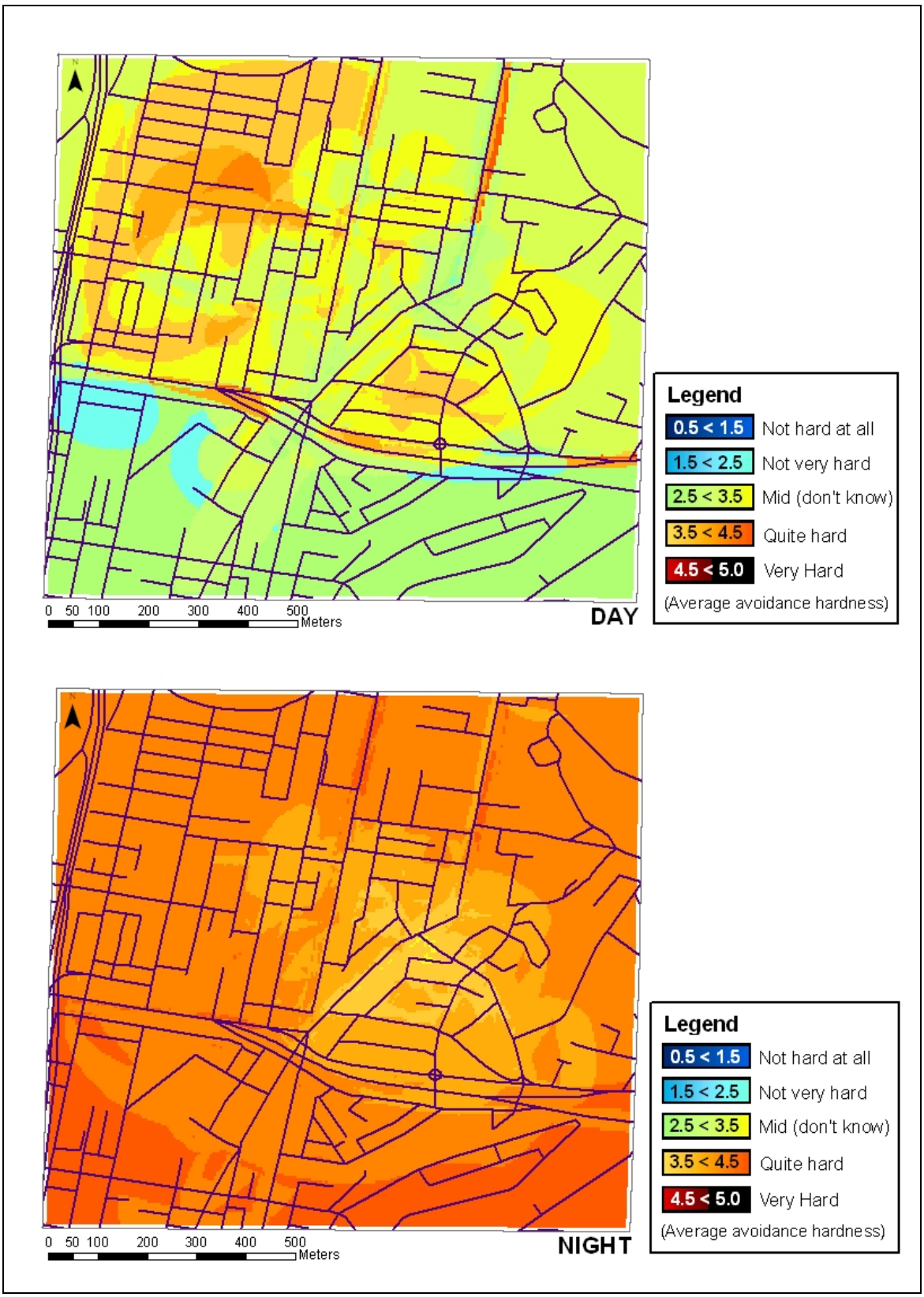


Figure 166. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of RUBBISH / SYRINGES triggered their fear of being robbed, beaten or attacked – during the day and night.

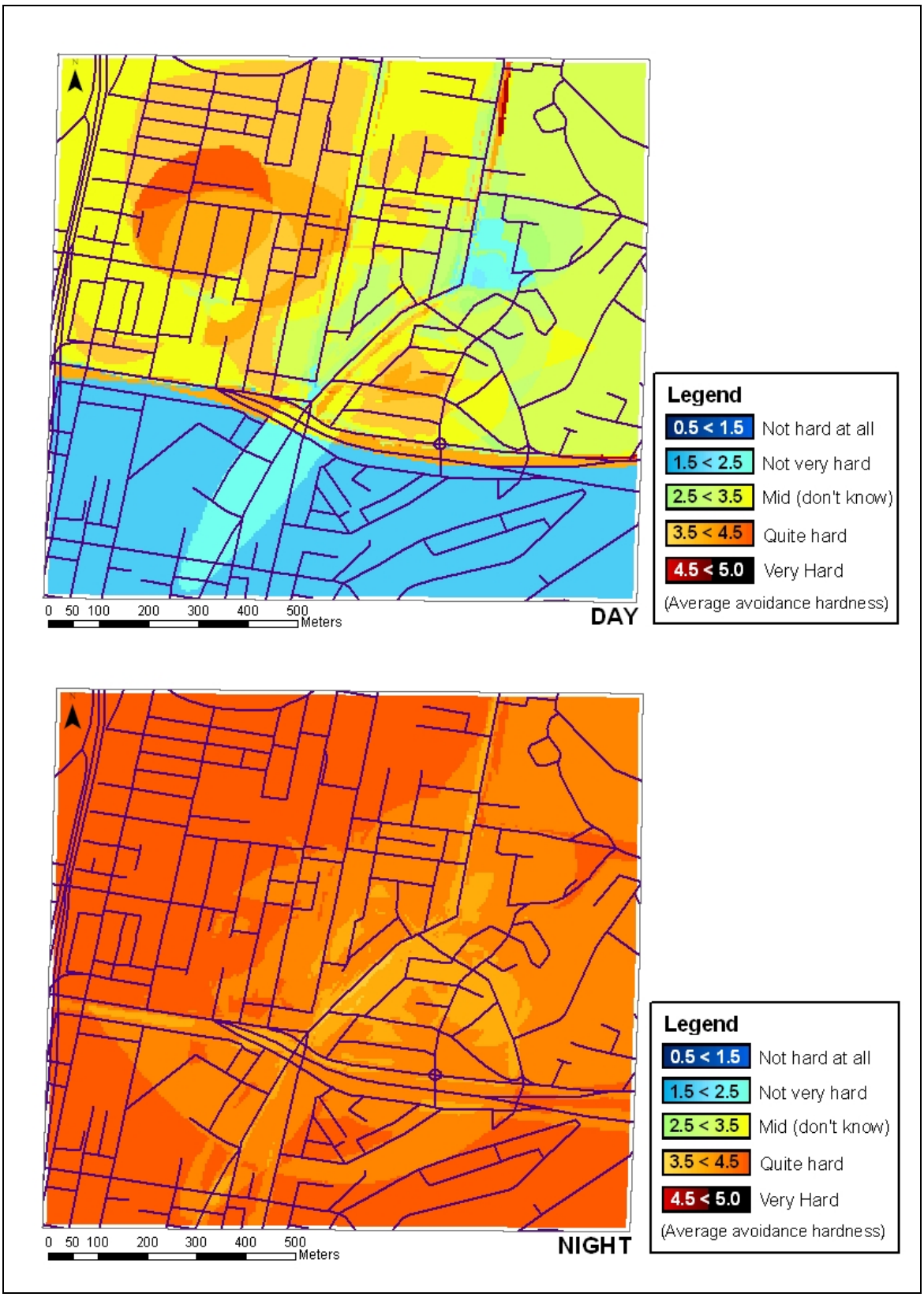


Figure 167. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of RUNDOWN / ABANDONED BUILDINGS triggered their fear of being robbed, beaten or attacked – during the day and night.

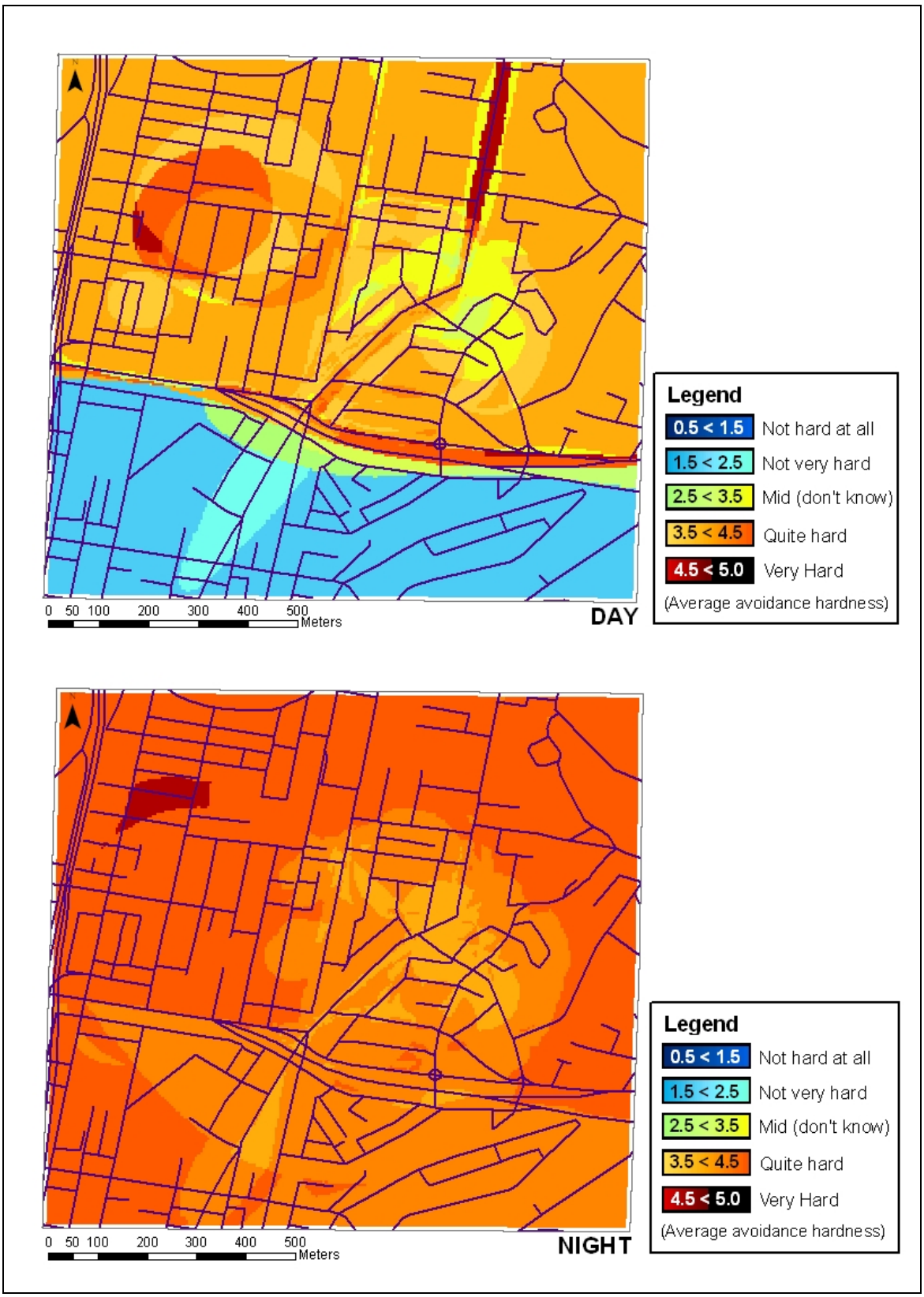


Figure 168. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of OFFENSIVE / DEGRADED SHOPS triggered their fear of being robbed, beaten or attacked – during the day and night.

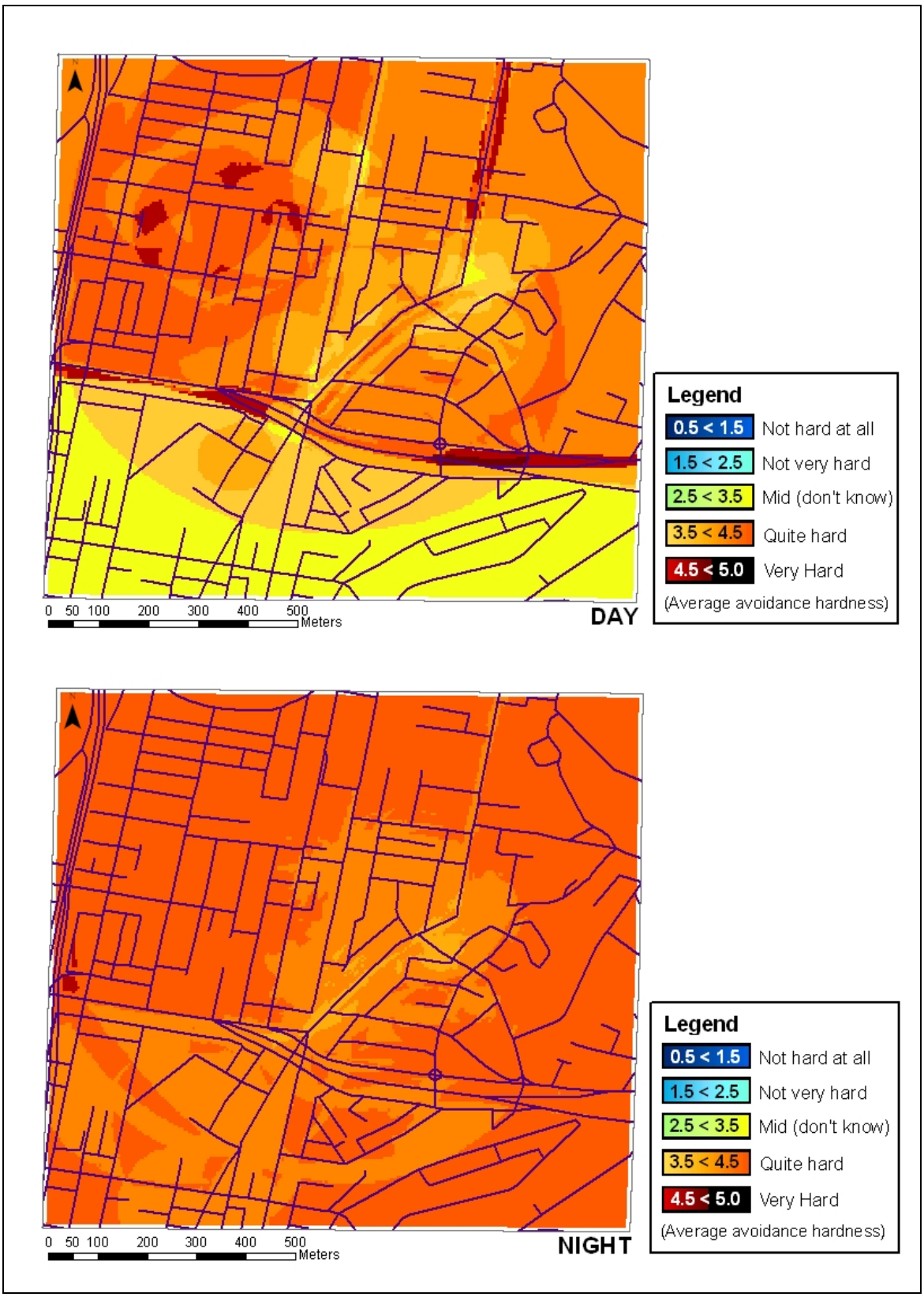


Figure 169. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of AREAS TO HIDE triggered their fear of being robbed, beaten or attacked – during the day and night.

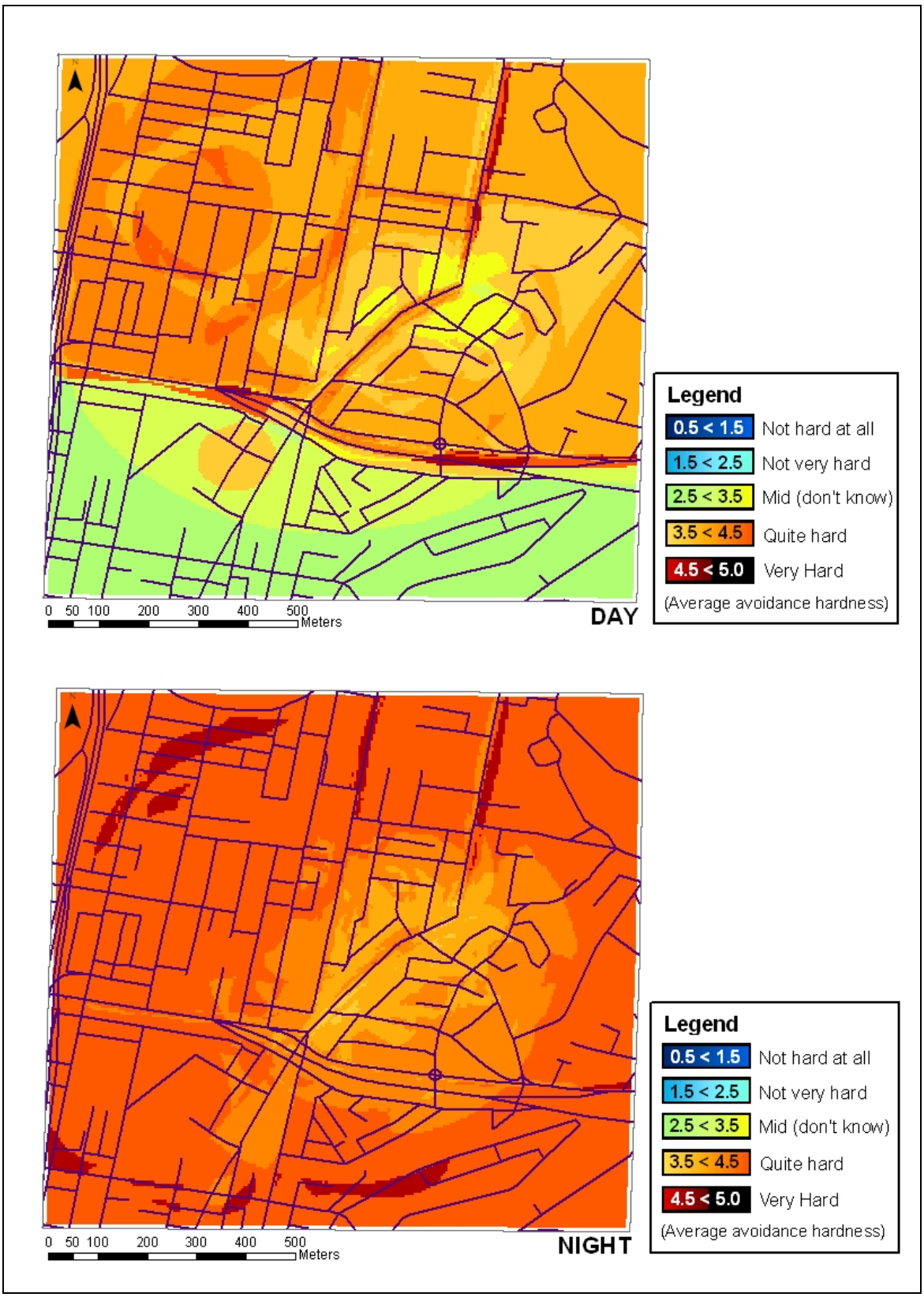


Figure 170. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of BLOCKED ESCAPE triggered their fear of being robbed, beaten or attacked – during the day and night.

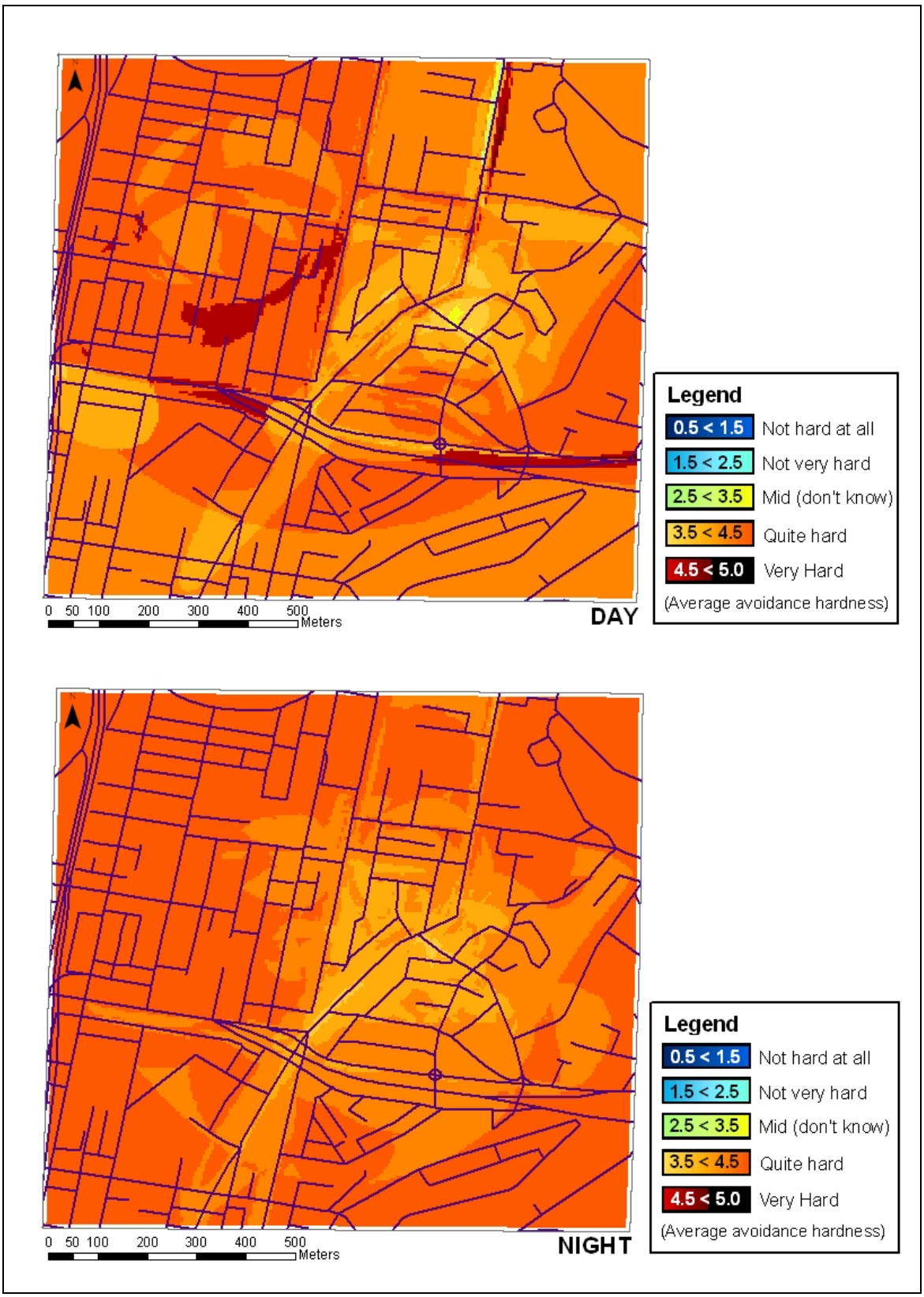


Figure 171. Average degree of avoidance hardness for areas where the survey respondents stated that the presence of LANEWAYS triggered their fear of being robbed, beaten or attacked – during the day and night.

15.6. A multi-angular view of the three-dimensional avoidance maps

The 3D maps are displayed and described in the results. Only one angle of the maps are provided. To view the 3D maps from all angles please open the electronic movie files on the accompanying CD. The filenames are listed below:

- Areastohide_Day_All (Areas where the respondents stated that the presence of areas to hide triggered their fear of crime during the day)
- Areastohide_Night_All (Areas where the respondents stated that the presence of areas to hide triggered their fear of crime during the night)

- Drugusers_Day_All (Areas where the respondents stated that the presence of drug users triggered their fear of crime during the day)
- Drugusers_Day_Females (Areas where the female respondents stated that the presence of drug users triggered their fear of crime during the day)
- Drugusers_Day_Males (Areas where the male respondents stated that the presence of drug users triggered their fear of crime during the day)
- Drugusers_Day_Residents (Areas where the residents stated that the presence of drug users triggered their fear of crime during the day)
- Drugusers_Day_Visitors (Areas where the residents stated that the presence of drug users triggered their fear of crime during the day)
- Drugusers_Night_All (Areas where the respondents stated that the presence of drug users triggered their fear of crime during the night)
- Drugusers_Night_Females (Areas where the female respondents stated that the presence of drug users triggered their fear of crime during the night)
- Drugusers_Night_Males (Areas where the male respondents stated that the presence of drug users triggered their fear of crime during the night)
- Drugusers_Night_Residents (Areas where the residents stated that the presence of drug users triggered their fear of crime during the night)
- Drugusers_Night_Visitors (Areas where the residents stated that the presence of drug users triggered their fear of crime during the night)

- Gangs_Day_All (Areas where the respondents stated that the presence of gangs triggered their fear of crime during the day)
- Gangs_Night_All (Areas where the respondents stated that the presence of gangs triggered their fear of crime during the night)

- Sexworkers_Day_All (Areas where the respondents stated that the presence of sex workers triggered their fear of crime during the day)
- Sexworkers_Day_Females (Areas where the female respondents stated that the presence of sex workers triggered their fear of crime during the day)
- Sexworkers_Day_Males (Areas where the male respondents stated that the presence of sex workers triggered their fear of crime during the day)
- Sexworkers_Day_Residents (Areas where the residents stated that the presence of sex workers triggered their fear of crime during the day)
- Sexworkers_Day_Visitors (Areas where the residents stated that the presence of sex workers triggered their fear of crime during the day)
- Sexworkers_Night_All (Areas where the respondents stated that the presence of sex workers triggered their fear of crime during the night)
- Sexworkers_Night_Females (Areas where the female respondents stated that the presence of sex workers triggered their fear of crime during the night)
- Sexworkers_Night_Males (Areas where the male respondents stated that the presence of sex workers triggered their fear of crime during the night)
- Sexworkers_Night_Residents (Areas where the residents stated that the presence of sex workers triggered their fear of crime during the night)
- Sexworkers_Night_Visitors (Areas where the residents stated that the presence of sex workers triggered their fear of crime during the night)

16. Appendix C: Photographs of Kings Cross

This appendix displays photographs of the Kings Cross study site. These photos were taken after the interviewing took place in 2004.

Plate 1. Darlinghurst Road, Kings Cross. Looking north from Bayswater Road junction. Notice the building architecture and road works reflects the history of Kings Cross and the current development interest in the region.

Plate 2. Darlinghurst Road, Kings Cross, looking east. Notice the adult entertainment premises and their resident spruikers.

Plate 3. Darlinghurst Road, Kings Cross. Restaurants and Cafes are encouraging alfresco dining.

Plate 4. The fountain and Fitzroy Gardens. A popular tourist attraction.

Plate 5. Springfield Avenue, off Darlinghurst Road. One of the more developed laneways in the area.

Plate 6. New paving on Macleay Street. Reflects some of the regions history.

The following photos were taken in 2007.

Plate 7. Sydney Place, Woolloomooloo. Featuring public amenities including the tennis courts, play ground, community garden, graffiti art and laneways.

Plate 8. Council signs to control disorder around Sydney Place, Woolloomooloo.

Plate 9. Public and private CCTV around Sydney Place, Woolloomooloo.

Plate 10. William Street, looking east.

Plate 11. A laneway in Woolloomooloo.

Plate 12. The railway viaduct in Woolloomooloo.